PACIFIC TERMINAL SERVICES INC.
INDEX OF STANDARD OPERATING PROCEDURES

SOP Number	Title
SOP-01	Asbestos, Man-Made Vitreous Fiber, and Inorganic Lead
SOP-02	Hazard Communication
SOP-03	Storage, Handling and Use of Hazardous Chemicals
SOP-04	Hearing Conservation
SOP-05	Hydrogen Sulfide (H2S)
SOP-06	Lockout/Tagout
SOP-07	Personal Protective Equipment (PPE)
SOP-08	Powered Industrial Vehicle
SOP-09	Relief Device Procedure
SOP-10	Respiratory Protection
SOP-11	Vehicle Safety Standard
SOP-12	Confined Space Entry
SOP-13	Contractor Safety
SOP-14	Hot work/Vehicle Entry Permit
SOP-15	Safe Work Program
SOP-16	Elevated Workspace
SOP-17	Tank Overfill Protection
SOP-18	Waste Management
SOP-19	Excavation and Trenching
SOP-20	Flying Switch Procedure
SOP-21	Railspur Operations
SOP-22	Shore Tank Transfer Procedure
SOP-23	Barge or Vessel Procedures
SOP-24	Boiler Operations
SOP-25	Gauging and Sampling Procedure
SOP-26	Truck Procedures
SOP-27	Hazard Communications Program
SOP-28	Management of Change

PACIFIC TERMINAL SERVICES INC

INDEX OF STANDARD OPERATING PROCEDURES

SOP Number	Title	Revision Level	Effective Date	Author
SOP-01	Asbestos, Man-Made Vitreous Fiber, and Inorganic Lead	1	02/01/02	NLW
SOP-02	Hazard Communication	0	10/01/00	NLW
SOP-03	Storage, Handling and Use of Hazardous Chemicals	0	09/01/00	NLW
SOP-04	Hearing Conservation	0	10/01/00	TMG
SOP-05	Hydrogen Sulfide (H_2S)	0	06/01/00	TMG
SOP-06	Lockout/Tagout	1	06/01/00	TMG
SOP-07	Personal Protective Equipment (PPE)	1	06/01/00	TMG
SOP-08	Powered Industrial Vehicle	1	02/01/02	NLW
SOP-09	Relief Device Procedure	1	03/01/02	NLW
SOP-10	Respiratory Protection	1	06/01/00	TMG
SOP-11	Vehicle Safety Standard	0	02/01/02	NLW
SOP-12	Confined Space Entry	0	03/01/02	NLW
SOP-13	Contractor Safety	0	03/01/02	NLW
SOP-14	Hot work/ Vehicle Entry Permit	1	06/01/00	TMG
SOP-15	Safe Work Program	0	03/01/02	NLW
SOP-16	Elevated Workspace	1	06/01/00	NLW
SOP-17	Tank Overfill Protection	1	09/01/00	NLW
SOP-18	Waste Management	0	03/01/02	NLW

1.0 SCOPE

Asbestos, man-made vitreous fiber (MMVF) and inorganic lead present potential hazards to employees. This standard provides the minimum guidelines for employees who perform jobs on or around asbestos, MMVF or inorganic lead.

1.1 References

This Standard references, ***but is not limited to:***

- FAMM Standard Facility Practice No. SFP-03
- Occupation Safety and Health Administration (OSHA) 29 CFR 1926.62

1.2 Definitions

- "Action level" - refers to employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air (30 ug/m(3)) calculated as an 8-hour time-weighted average (TWA).
- Affected Employee – refers to any employee whose job requires them to work around or on ACMs or suspected ACMs, including the management of waste ACMs.
- Asbestos – includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated and/or altered.
- Asbestos-Containing Material (ACM) – means any material containing more than 1% asbestos.
- Friable Asbestos – refers to ACM that can be crumbled with hand pressure and is therefore likely to release asbestos fibers. The fibrous or fluffy sprayed-on materials used for fire-proofing, insulation, or sound proofing are considered non-friable and generally do not emit airborne

fibers unless subjected to sanding or sawing operations. Asbestos-cement pipe or sheet can release airborne fibers if the materials are cut or sawed, or if they are broken during demolition operations.

- **Known ACM** – refers to any material which is known to contain asbestos either through examination of the manufacturer's specifications or sampling.

- **Suspected ACM** – refers to any of the types of materials listed below which have not been determined to be asbestos free by means of the manufacturer's specifications or sampling:
  - insulation
  - roofing materials
  - cementitious siding or shingles
  - transite panels and siding
  - automotive brakes and clutches
  - gasket material
  - wall board
  - floor tiles
  - transite piping
  - ceiling tiles

- **MMVF** – refers to a family of man-made commercial products used for thermal insulation, heat shielding, and other purposes. Commercial MMVF materials can be classified into three main categories, based on their physical and chemical properties: 1) fiberglass; **2**) mineral wool (also known as rock or slag wool); and 3) refractory ceramic fiber. MMVF materials are commonly used as a substitute for asbestos and asbestos-containing materials.

- **Inorganic Lead** – refers to metallic lead, or lead bound in chemical compounds such as sulfates or oxides, and specifically excluding lead in the organic compounds (e.g., tetraethyl lead) associated with some types and grades of petroleum products. Inorganic lead compounds are commonly found in paint or pigments. Chronic exposure to the dusts and fumes associated with lead-based painting operations (or the scaling, chipping, sanding, or grinding of painted metal or wood surfaces) represents a potential health hazard.

2.0 GENERAL

This Standard addresses the minimization of potential for or prevention of occupational exposure to asbestos, man-made vitreous fiber, and inorganic lead for employees, contractors, and visitors to the Pacific Terminal Services facilities. Such exposures may be the result of:

- Construction, renovation or demolition activities;
- Maintenance or repair activities;
- Inspection or sampling activities; and/or
- Janitorial or housekeeping activities in an area with asbestos-, MMVF-, or lead-containing materials.

3.0 RESPONSIBILITY

- It is the responsibility of the Facility Manager to ensure that the facility complies with the minimum standards defined by this Standard and all applicable national, state and/or local regulations.

- Facility Management shall provide training to each affected employee regarding:
  - The presence of known or suspected ACMs, or MMVF in the facility;
  - Limitations of employee involvement in disturbance, removal or repair of ACMs or MMVF installations;
  - Proper management and disposal of waste ACMs and MMVF materials; and
  - Proper respiratory protection and other PPE necessary for working with ACMs or MMVF materials.

4.0 GENERAL REQUIREMENTS

The following minimum general standards for ACM, MMVF, and inorganic lead managements shall apply to all facilities:

4.1 MANAGEMENT OF ACMs

- Asbestos is often present in the following forms:
  - insulation
  - gasket material

- roofing materials
- cementitious siding or shingles
- transite panels and siding
- automotive brakes and clutches
- wall board
- floor tiles
- transite piping
- ceiling tiles

- Any demolition or renovation project at the facility shall include an assessment as to the potential for encountering ACMs. This assessment shall be made prior to beginning demolition or renovation.

- The disturbance or removal of significant quantities of ACMs during any demolition or renovation project shall be performed only by a qualified asbestos contractor. Exceptions may include the removal of small amounts of non-friable asbestos, such as removal of a gasket. In this instance, employees may perform this task provided the employee is trained in proper management and disposal of ACMs.

- In order to minimize exposure to airborne asbestos fibers, it should be a facility goal to remove existing friable asbestos as the opportunity arises. The removal and replacement of non-friable asbestos shall be determined on a case-by-case basis by the Facility Manager.

- All ACMs, including friable and non-friable forms, still in use at the facility shall be properly maintained to prevent asbestos fibers from becoming airborne.

- Employees shall not be allowed to perform grinding, cutting, sawing, sanding, or other operations in which friable or non-friable asbestos particles may become airborne.

- Known ACMs shall be labeled to the extent that a person performing work on the ACM would be reasonably expected to identify the presence of asbestos prior to beginning work.

- ACMs are considered to be a "waste of concern", and therefore must be disposed of at offsite disposal facilities which are permitted to accept ACMs.

- All ACMs destined for disposal shall be wetted with water, placed in a plastic bag, sealed and labeled immediately upon removal from service. The ACMs shall be disposed in accordance with all applicable national, state, and/or local regulations.

- Facility management shall supply and require affected employees to use appropriate PPE, including respiratory protection, when employees are required to work with or manage ACMs.

- Facility Management shall provide training to each affected employee regarding:
  - The presence of known or suspected ACMs in the facility;
  - Limitations of employee involvement in disturbance, removal or repair of ACMs;
  - Proper management and disposal of waste ACMs; and
  - Proper respiratory protection and other PPE necessary for working with ACMS.

- The facility shall maintain records to demonstrate compliance with this SOP. Such records may include asbestos management plans, training documents, inspection forms, and other documents.

4.2 MANAGEMENT OF MMVF

Appropriate respiratory protection shall be required by personnel in areas in which eight-hour time-weighted average personal breathing zone concentrations of MMVF exceed the following values:

MMVF Form	Exposure Limit
Fiberglass	1.0 fibers/cubic centimeter of air
Mineral Wool	1.0 fibers/cubic centimeter of air
Refractory Ceramic Fibers	0.2 fibers/cubic centimeter of air

- MMVF exposures shall be minimized by:
  - Limiting unnecessary access to work areas with MMVF installations in progress, or active construction or maintenance activities in which MMVF materials may be disturbed;

  - Purchase of MMVF materials in forms that minimize the need for cutting, forming or shaping MMVF materials during installations;
  - Use of good industrial hygiene practices (e.g. use of appropriate respiratory protection devices or dust suppression methods) by employees or contractors involved in MMVF handling, installation, removal, inspection or repair;
  - Use of qualified employees and contractors for MMVF handling, installation, removal, inspection, or repair; and
  - Communication with employees, contractors, or visitors regarding the potential hazards associated with MMVF.
- Any demolition or renovation project at the facility shall include an assessment as to the potential for encountering MMVF installation, prior to beginning the demolition or renovation.
- The disturbance or removal or significant quantities of MMVF materials during any demolition or project shall be performed with appropriate respiratory controls (see SOP for Respiratory Protection).

- All MMVF installations shall be properly maintained (e.g., taped, covered, coated, or sealed) to prevent fibers from becoming airborne when the installation is in service.

- All grinding, cutting, sawing, sanding, or other operations in which MMVF materials may become airborne shall be performed under appropriate respiratory protection and dust suppression controls.

- MMVF waste materials destined for disposal shall be wetted with water, placed in a plastic bag, sealed and labeled. Disposal practices shall comply with all applicable national, state and local regulations.

- Facility Management shall provide training to each affected employee regarding:
  - The presence of MMVF installations in the facility;
  - Limitations of employee involvement in disturbance, removal or repair of MMVF installations;
  - Proper management and disposal of waste MMVF materials; and
  - Proper respiratory protection and other PPE necessary for working with MMVF materials.

- The facility shall maintain records to demonstrate compliance with this SOP. Such records may include asbestos/MMVF management plans, training documents, inspection forms, and other documents.

4.3 MANAGEMENT OF INORGANIC LEAD

- The employer shall assure that no employee is exposed to lead at concentrations greater than fifty micrograms per cubic meter of air (50 $\mu g/m^3$) averaged over an 8-hour period.
- If an employee is exposed to lead for more than 8 hours in any work day the employees' allowable exposure, as a time weighted average (TWA) for that day, shall be reduced according to the following formula:

  Allowable employee exposure (in ug/m(3)) = 400 divided by hours worked in the day.
- Facility management shall make a preliminary evaluation as to the potential presence of leaded paint or other common inorganic lead hazards at the facility. This preliminary evaluation may include inspection, sampling, and chemical analysis to determine if inorganic lead is present; and/or review of the Material Safety Data Sheets (MSDSs) of any hazardous materials stored onsite for the presence of lead.
- The preliminary evaluation shall be documented and kept in the facility records.
- Exposure to inorganic lead shall be controlled by:
  - Substitufion of lead-free or low-solubility lead paints or other compounds;
  - Use of lead emulsions or pastes instead of lead compounds in powdered form;
  - Containment of lead-containing compounds in totally closed equipment or containers;
  - Use of an effective local exhaust ventilation system
  - Use of respirators and other Personal Protective Equipment (PPE) to supplement administrative and engineering exposure control measures

- Posting of work areas where inorganic lead hazards/exposures exist; and
- Medical surveillance for employees whose work assignments are associated with chronic exposures to organic lead.

- The facility shall maintain records to demonstrate compliance with this SOP. Such records may include preliminary facility evaluation memoranda, inorganic lead management plans, training documents, inspection records, and other documents.

5.0 PERFORMANCE MONITORING

- Facility managers are responsible for performing or directing periodic self-evaluations or facility inspections to ensure that the asbestos management program is being properly and effectively implemented.
- At a minimum each facility shall:
  - Make an initial evaluation of the potential presence of ACMs to ensure that potential exposure to airbome asbestos fibers is minimized;
  - Perform periodic checks to ensure that affected employees are properly following the asbestos management program and the physical condition of asbestos or ACMs has not changed;
  - Conduct a periodic check of asbestos training and the associated training records; and
  - Take effective corrective and preventative action where deficiencies are observed.

1.0 SCOPE

It is PTSI policy that all customers, employees, contractors and other workers at the facility have both the need and right to know the hazards and identities of the chemicals they are exposed to when working with our products or within the facility. This standard provides the minimum standards for chemical hazard communication.

1.1 References

This Standard references, ***but is not limited to***:

- FAMM Standard Facility Practice No. SFP-09

1.2 Definitions

- **Affected Employee** – refers to any employee that is subjected to a hazardous chemical in the course of employment through any route of entry (e.g., inhalation, ingestion, skin contact, or absorption), including potential exposure from spills and emergencies.

- **Chemical** – refers to any element, chemical compound, or mixture of elements and/or compounds.

- **Container** – refers to any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or similar receptacle that contains a hazardous chemical. For the purpose of this standard, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers.

- **Hazardous chemical** – refers to any chemical which is a physical hazard or a health hazard.

2.0 RESPONSIBILITIES

- It is the responsibility of the Facility Manager to ensure that Material Safety Data Sheets (MSDSs) or equivalent chemical hazard information documents are available and kept current for each product handled by the facility.

- It is the responsibility of the Facility Manager to ensure that the facility complies with the minimum standards defined by this Standard and all applicable national, state and local regulations.

3.0 GENERAL REQUIREMENTS

- Facility management shall ensure that the facility develops a written hazard communication program that encompasses these standards. The program shall include the identification of a person(s) that will be responsible for the program.

- Facility management shall assess the facility to identify all hazardous chemicals in the facility and develop a written inventory list of the identified hazardous chemicals. This inventory list should include hazardous chemicals in all forms including solids, liquids, gases, vapors, fumes, mists and mixtures. The inventory list shall be kept current.

- Facility management shall obtain an MSDS or other equivalent chemical hazard information document for each hazardous chemical identified at the facility.

- Contractors shall be responsible and contractually obligated for providing MSDSs for any hazardous chemicals which they bring onto facility property.

- Copies of current MSDSs shall be made available to all employees, contractors, or others working within the facility for each hazardous chemical identified on the inventory list. These MSDSs shall be readily accessible during all hours during which these persons are in their work areas.

- Facility management shall ensure that all containers of hazardous chemicals within the facility are properly labeled, tagged, or marked with the identity of the chemical and the hazards of the chemical (consistent with information provided in the associated MSDS). The specific chemical hazards of the contents of individual stationary process containers and/or piping within the facility may be communicated by signs, placards, process sheets, operating procedures, or other means, in lieu of affixing labels.

- Facility management shall ensure that each container of product shipped from the facility shall be labeled, tagged, or plainly marked to identify the chemical and the hazards of the chemical.

- Facility management shall ensure that each affected employee receives training on the chemical hazard communication program. Training programs shall include initial training at the time of the initial assignment, additional training whenever new physical or health hazards are encountered, and annual retraining/education to reestablish employee proficiency in chemical hazards.

- The facility shall maintain records to demonstrate compliance with this Standard. Such records may include hazardous chemical inventory lists, the written hazardous communication program, training documents, inspection forms, and other documents.

4.0 PERFORMANCE MONITORING

Facility managers are responsible for performing periodic self evaluations or facility inspections to ensure that the hazard communication program is being effectively implemented.

At a minimum, each facility shall:

- Evaluate the hazardous chemical inventory annually to ensure that new chemical hazards have not been introduced;
- Perform periodic checks to ensure that affected employees are properly trained on chemical hazards;
- Conduct a period check of chemical hazard communication training and the associated training records; and

- Take effective corrective and preventative action where deficiencies are observed.

1.0 SCOPE

It is PTSI policy to manage hazardous chemicals in a manner which prevents the accidental discharge of hazardous chemicals which could pose a hazard or health threat to employees, or which could impact the environment. This standard operating procedure addresses the storage, handling and use of hazardous chemicals.

1.1 References

This Standard references, ***but is not limited to:***

- FAMM Standard Facility Practice No. SFP-21

1.2 Definitions

- **A**ffected **E**mployee – refers to any employee that is subjected to a hazardous chemical in the course of their employment through any route of entry (e.g. inhalation, ingestion, skin contact or absorption), including potential exposures from spills and other emergencies.

- **C**hemical – refers to any element, chemical compound, or mixture of elements and/or compounds.

- **C**ontainer – refers to any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or similar receptacle that contains a hazardous chemical. For the purpose of this standard, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers.

- **H**azardous chemical – refers to any chemical which is a physical hazard or a health hazard.

2.0 RESPONSIBILITIES

- It is the responsibility of the Facility Manager to ensure that the facility complies with the minimum standards defined by this Standard and all applicable national, state and/or local regulations.

3.0 GENERAL REQUIREMENTS

The following minimum general standards for the storage, handling and use of hazardous chemicals shall apply to the facility:

- The facility shall obtain a Material Safety Data Sheet (MSDS) or equivalent information sheet prior to bringing any new hazardous chemical into the facility.

- Hazardous chemicals shall only be stored in tanks, containers, or equipment constructed of materials which are compatible with the chemicals being stored.

- Drums and bulk containers which have been emptied of hazardous chemicals will be considered to be "empty used containers" and shall be managed in accordance with the **SOP** for **E**mpty Container Management.

- When possible, small containers, drums, and bulk containers of hazardous chemicals shall be stored within a warehouse or other structure which provides:

  - A stable surface for container storage;
  - A roof to prevent contact with precipitation;
  - Secondary containment consisting of an impermeable floor and containment walls, dikes, or berms, of adequate volume to contain any reasonably possible scenario of spills or discharges;
  - Security from unauthorized entry or tampering;
  - Adequate fire protection, emergency alarm systems and means of egress in the event of an emergency;
  - Adequate separation/isolation of incompatible, mutually reactive materials; and

- Adequate aisle space for container transfers as well as for emergency response.
- Warehouses or other structures used for storage of hazardous chemicals shall be built and maintained to meet all applicable fire and building codes.

- Small containers, drums, bulk containers or tanks of hazardous chemicals shall not be stored over or near a surface water body or conveyance to a surface water body without an adequate means of secondary containment.

- All tanks which are used to store hazardous chemicals shall comply with the SOP for Minimum Above-Ground Tank Standards.

- All new tank systems installed after the effective date of this SOP shall be designed and installed with adequate secondary containment. Existing tank systems which do not have adequate secondary containment shall be prioritized based upon the risk of a release and upgraded to incorporate adequate secondary containment as the opportunity arises. Adequate containment provisions shall include:

  - Secondary containment by means of dikes, berms, retaining walls, curbing, retention ponds, sumps, or other means of liquid containment which is constructed of materials impervious enough to contain the material(s) being stored;
  - Sufficient containment capacity to hold at a minimum the volume of the largest tank within the secondary containment plus an additional 10 percent (or the equivalent of a 25-year, 24-hour storm event) for precipitation; and
  - A means of inspecting or testing accumulated precipitation prior to discharge from the secondary containment.

- Small containers, drums, bulk containers, and tanks of hazardous chemicals shall be marked, labeled, tagged or otherwise documented as to the contents and hazards.

- Incompatible or mutually reactive chemicals (e.g. acids or bases) in drums, bulk containers, or tanks shall not be stored together without

some physical means of separation of spills or releases (e.g. a containment berm or fire wall).

- Drums or bulk containers of hazardous chemicals may be stacked only when the containers are structurally designed to allow for stable stacking, and the stacking can be done in a safe manner.

- Drums, bulk containers, and tanks of hazardous chemicals shall be stored with bungs, lids, caps, valves, roofs, manholes, or other openings in a closed position, except as necessary to remove or add materials or for safety measures (e.g., pressure relief valves).

- Drums and bulk containers of hazardous materials shall only be moved or transferred within the facility by qualified personnel, using appropriate powered industrial vehicles or equipment. Such vehicles shall be operated and maintained in accordance with the SOP for Powered Industrial Vehicles.

- Each hazardous chemical used or handled within the facility shall be assessed as to the appropriate level of PPE to be used. This assessment shall be conducted in accordance with the SOP for Personal Protective Equipment (PPE).

- Affected employees shall be properly trained on the safe handling of each hazardous chemical (including the appropriate PPE to use) that the affected employee might encounter in performing his/her job. This training should be part of the overall Hazard Communication Program as described in the SOP for Hazard Communication.

- Spills and leaks of hazardous chemicals shall be addressed immediately upon detection in order to minimize the potential impact on employee health and/or the environment. Spill response shall be conducted in accordance with the facility Oil Spill Contingency Plan. ***In no case, however, shall employees perform or conduct emergency response activities for which the employee is not properly trained or which puts the employee or other personnel at risk.***

- Contractors performing work at the facility shall be subject to the same or equivalent hazardous chemical management standards, for any hazardous chemicals managed on site by the contractor.

- The facility shall maintain records to demonstrate compliance with this SOP. Such records may include inspection forms, training records and other related documents.

4.0 PERFORMANCE MONITORING

Facility managers are responsible for performing or directing periodic self-evaluations or facility inspections to ensure that the hazardous chemical management program is being properly and effectively implemented. At a minimum, the facility shall:

- Perform periodic inspections to ensure that proper hazardous chemical container and tank management practices are being followed;
- Perform periodic checks to ensure that all hazardous chemicals used on site have an appropriate MSDS (or equivalent) in a place accessible to all employees;
- Perform periodic checks to ensure that all employees are receiving adequate training in hazardous chemical management and that the appropriate PPE has been selected and is being properly worn; and
- Take effective corrective and preventative action where deficiencies are observed.

1.0 SCOPE

The Hearing Conservation Program Standard is designed to:

- Prevent occupational noise-related hearing loss of PTSI employees
- Meet all federal hearing conservation requirements

This Standard addresses noise exposures that equal or exceed an 8-hour time-weighted average (TWA) sound level of 85 dBA, measured on the A-scale (slow response), or a noise scale of 501%.

1.1 References

This standard references, ***but is not limited to***:

- American National Standards Institute (ANSI), S1.4-1971 and 53.19-1974
- Occupational Safety and Health Administration (OSHA) 29 CFR 1910.95

1.2 Definitions

- Action Level – An 8-hour TWA of 85 dBA, or an equivalent noise dose of 50%.
- Audiologist – A professional specializing in the study and rehabilitation of hearing, who is certified by the American Speech-Language-Hearing Association or licensed by a state board of examiners.
- dBA – Sound level measurement on the A scale (slow response).

- Noise Dosimeter – An instrument that integrates a function of sound pressure over a period of time in such a manner that it directly indicates a noise dose.

- **NRR** (Noise **R**eduction **R**ating) – The factor indicating the level of reduced noise resulting from the use of specific hearing protection devices.

- **S**ound **L**evel **M**eter – An instrument that measures sound level.

- .Time-Weighted Average (TWA) **S**ound **L**evel – The equivalent 8-hour.

2.0 RESPONSIBILITY

The following program elements outline the requirements of a successful hearing conservation program:

- Training

- Exposure Determination

- Noise Control Evaluation

- Hearing Protection Areas and Job Classifications

- Hearing Protection Devices

- Audiometric Screening

- Medical **R**eferrals

- Noise Control Engineering

- Equipment Purchasing

- Documentation

- Transfer of Records

3.0 GENERAL REQUIREMENTS

3.1 Training

- Provide hearing conservation program training to all employees who are exposed to noise *at or above* an 8-hour TWA of 85 dBA.
- Re-train in the hearing conservation program at least annually or as changes occur for each employee.
- Update training information when there are changes in:
  - Effects of noise on hearing
  - Purpose of hearing protection devices
  - Advantages/disadvantages of the hearing conservation program
  - Attenuation options
  - Instructions for selecting, fitting, use, and care of hearing protection devices
  - Purpose and explanation for audiometric testing and procedures

3.2 Exposure Determination

Management will request sound-level surveys and employee noise-exposure surveys of all operations as necessary.

3.3 Noise Control Evaluation

- Managers and supervisors conduct a sound-level survey and/or employee noise-exposure survey if they suspect a work-related noise problem.

- For help in identifying potential problem areas or conducting noise surveys, contact the appropriate health and safety representative.

3.4 Hearing Protection Areas and Job Classifications

- Designate as "Hearing Protection Required" all areas and occupations in which employees may be exposed to noise *equal to or greater than* 85 dBA.

- Survey each area, job category, and activity that may involve noise exposure, and notify affected managers of the survey results. Post signs designating that hearing protection is required for employees working in these areas. Note: Only use signs that meet all OSHA requirements.

- Employees that have exposure monitoring conducted on them must receive written notification of results within 15 working days of receiving results. Hearing protection will be made available for all employees exposed to 85 dBA or greater. Noise monitoring data can be made available for annual training programs

3.5 Hearing Protection Devices

- Provide employees with ANSI-approved hearing protectors with a minimum of a 25 dBA noise reductions rating NRR. Check hearing protection package of ANSI approval and NRR.

- For very high noise levels, a combination of ear plugs and earmuffs may be required to reduce the noise level to less than 85 dBA.

- Line supervision enforces the use of hearing protection, and takes disciplinary action when posted procedures are not followed.

3.6 Audiometric Screening

- Employees that fall into a hearing conservation program will receive audiometric screening as part of the pre-employment physical process.
- Administer audiometric screening at least once a year to employees exposed to noise above an 8-hour TWA 85 dBA.
- Proper audiometric screening requires that an employee NOT be exposed to any loud noises for *at least* 14 hours before the screening. Therefore, it is necessary to test at the *beginning* of the shift,

3.7 Medical Referrals

- Employee must be notified and re-tested in 21 days when audiometric screening suggests an abnormality in hearing.
- If the Re-test produces the same results, refer the employee to an Otolaryngologist, Occupational Physician, Certified Audiologist. Or other qualified medical personnel for medical determination of his condition.
- If the disclosed condition could affect the safe execution of the employee's job, or will continue to decline, the employee's supervisor must initiate altemative actions. These altemative actions will include retraining of employee on the use of hearing protection and any other recommended special precautions. The possibility of a temporary or permanent transfer may occur depending on the situation.

3.8 Noise Control Engineering

- When possible, design all plant additions and major revamping projects to be *below* the maximum permissible noise exposure of 85 dBA for 8 hours.

- Whenever noise control projects are planned or executed, the maximum allowable noise level is 85 dBA for 8 hours or less (82 dBA for 8 to 12 hours).

- Projects with excessive noise control costs must be evaluated case-by case for the best altemative that ensures employee hearing conservation.

3.9 Equipment Purchasing

All major equipment purchases require consideration of provisions for noise control (85 dBA or less at the operator's position for 8 hours or less, or82 dBA or less for 8 to 12 hours).

3.10 Documentation

Accurate records of the following must be maintained as specified in 29 CFR 1910.95:

- Noise exposure measurement records must be kept for a minimum of 30 years.

- Audiometric test records must be kept for duration of employment plus a minimum 30 years.

Refer all record requests to the PTSI Human Resources representative.

3.11 Transfer of Records

- If the business sells or closes, transfer all records to the new employer. The new employer is required to maintain the records according to 29 CFR 1910.95(F), (5).

- If there is no successor employer, the current employer must notify employees of their access rights 3 months prior to cessation of doing business. The director of National Institute of Occupational Safety and

Health (NIOSH) must also be notified in writing 3 months prior to the disposal of records.

- Requests for records should be referred to the PTSI Human Resources representative.

1.0 SCOPE

The following procedure establishes guidelines for safely handling hydrogen sulfide (H_2S) in PTSI facilities.

1.2 RESPONSIBILITY

All PTSI personnel working with or around product containing hydrogen sulfide are responsible for the following procedures.

2.0 PROCEDURES

- Hydrogen Sulfide monitors/testing equipment must be used to test and/or monitor the atmosphere when a cargo is known to contain or is suspected to contain H_2S. Prior to beginning operations, facility personnel must check H_2S testing and safety equipment for proper operation.

- If testing indicates that H_2S concentrations have reached **10** ppm in the general work area, operations must be shut down and personal protective equipment must be donned before operations restart. Organic vapor canister masks must be worn if operations continue when levels of H_2S exceed 10ppm.

- If H_2S levels in the general work area exceed **20** ppm, operations must cease. Contact the Operations Supervisor and the Operations Manager to discuss options for either continuation or termination of operations.

- If at any time personnel are in doubt regarding their protection from hazardous concentrations of H_2S vapors, they should consult the Operations Manager.

- If in doubt of personal safety, operations should be shut down and secured until safe conditions are verified.

3.0 HYDROGEN SULFIDE EXPOSURE LIMITS:

- 5 ppm: Threshold Limit Value (TLV) from ACGIH*
- 10 ppm: WISHA 8-hour Time-Weighted Average (TWA)
- 15 ppm: WISHA Ceiling (C) concentration that may not be exceeded at any time in an 8-hour shift
- 20 ppm: Federal OSHA and OR-OSHA Ceiling (C) concentration that may not be exceeded at any time in an 8-hour shift
- 50 ppm: Federal OSHA and OR-OSHA Maximum Peak, allowed once for 10 minutes in an 8-hour shift
- 100 ppm: Immediately Dangerous to Life and Health (IDLH) refers to respiratory exposure to an air concentration of H_2S that poses an immediate threat to employees of loss of life, immediate or delayed irreversible physical harm, or acute eye exposure that would prevent escape from the hazardous atmosphere.

**American Conference of Governmental Industrial Hygienists, the professional organization that publishes worker exposure guidelines*

4.0 HYDROGEN SULFIDE HAZARDS AND PRECAUTIONS

4.1 Characteristics of H_2S

- H_2S is a colorless gas that is heavier than air
- H_2S has a characteristic rotten egg smell
- H_2S is extremely toxic

4.2 Toxic Effects of H_2S

- Exposures to H_2S concentrations of above 50 ppm are likely to result in eye, nose, mouth, and respiratory tract irritations after about one hour. Nerve function is paralyzed by H_2S, and as a consequence the sense of smell is quickly lost.

- The only dependable method of determining H_2S concentration is by testing with proper instrnments. Specific factors affecting the volume and concentration of H_2S in the atmosphere on barge/tank loading include the following:

  - The temperature of the cargo. The higher the temperature the more H2S evaporates into the atmosphere.

  - The concentration of H_2S in the cargo

  - The loading densities of H_2S in the cargo tanks.

  - The composition of the cargo itself. Oil may contain sulfur components that continue to generate H2S through decomposition; this H_2S then evaporates into the atmosphere above the liquid.

  - The degree of agitation the liquid in the tank experiences during transfer operations.

  - The air circulation in work areas.

4.3 Toxic effects of H_2S at various levels

- 10 ppm: Can smell and taste the vapor. A canister mask or its equivalent with an H_2S canister must be worn.

- 50 ppm: Acute eye pain and respiratory tract irritation occurs after exposure for approximately one hour.

- 200 ppm: Nausea, vomiting, abdominal cramps and delayed lung damage after prolonged exposure; sense of smell deadens rapidly.

- 300 ppm: Dizziness, headache, and nausea occur within 15 minutes; loss of consciousness, possible death after 30-60 minutes. Rescue and recovery must be rapid.

- 700 - 1,000 ppm: Death is apparently instantaneous due to respiratory paralysis.

4.4 H_2S Emergency Procedures

- First aid/immediate actions

  - When an individual is overcome by H_2S, the first and most important step is to get the victim into clean air. If the victim requires artificial respiration, it must begin immediately. The longer the delay in starting artificial respiration, the greater risk of serious consequence. The use of oxygen may also be of assistance in bringing about a recovery from H_2S overexposure.

  - An individual who is revived quickly from unconsciousness due to H_2S overexposure will generally recover without any ill effects.

  - Any employee who has had a severe exposure must be evaluated by a medical doctor and the incident must be reported to that person's supervisor so that appropriate records can be kept.

- Spills and/or leaks

  - In the event of a spill or leak, stop all cargo transfer operations immediately. No one should enter the area until it has been tested for H_2S and appropriate personal protective equipment must be worn until monitoring demonstrates that the area is safe.

1.0 SCOPE

The Lockout/Tagout SOP establishes lockout/tagout standards for the purpose of preventing injuries to employees.

The procedures in this SOP must be followed to protect the safety and health of individuals from a potentially hazardous energy or substance during maintenance, repairs, new construction, or other work on or near a machine, process vessel, equipment, or system.

This Standard covers:

- The use of appropriate lockout/tagout devices on energy isolating devices.
- The use of appropriate lockout/tagout devices to disable machines or equipment to prevent unexpected energizing, startup, or release of stored energy.
- Energy control procedures during maintenance and/or servicing of machines and/or equipment.
- Necessary employee training and re-training for energy control during maintenance and/or servicing of machines or equipment.

<u>This Standard does NOT cover:</u>

- The use of locking devices for the purpose of security of piping and equipment to prevent tampering by unauthorized personnel.
- The use of chains, locks, car seals, etc., for the purpose of keeping valves at a facility either locked opened or locked closed for process control, or to ensure that overpressure protection (relief valves) is provided for piping and equipment.

Note: Facilities that use locking devices for the purposes described above must develop written procedures to control those devices, particularly to

identify those devices so they may be differentiated from lockout devices used for energy isolation purposes.

1.1 References

This Standard references, *but is not limited to:*

- Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.147, "The Control of Hazardous Energy (Lockout/ragout)"
- PTSI Confined Spaces SOP
- PTSI Hot Work/Vehicle Entry Permit SOP

1.2 Definitions

- Affected employee -- The affected employee:
  - Refers to anyone whose job requires operation of machines or equipment on which maintenance or service is performed under lockout/tagout.
  - Refers to anyone required to work in an area in which maintenance or service is being performed.
  - Must be informed by the authorized employee of the application and removal of lockout and tagout devices.
- Authorized employee -- The authorized employee:
  - Refers to anyone who locks or implements a tagout procedure on machines or equipment for the purpose of safely performing maintenance or service on the machines or equipment.
  - Appropriately notifies the affected employee of the application and removal of lockout and tagout devices.
- "Capable of being locked out" -- means having a hasp or other means of attachment to which, or through which, a lock can be affixed, or

having a locking mechanism built into it. *Note:* In the context of this Standard, and to provide maximum safety to all employees, if a device is "capable of being locked out," it shall be locked out.

- Control device -- same as Energy-isolating device

- Energized -- refers to any device connected to an energy source, or any device containing any stored or residual energy (e.g., electrical energy stored in a capacitor, or pressure from static head of liquid in a storage vessel).

- Energy isolating device -- a mechanical device that controls the supply of energy, machinery, or equipment. Energy-isolating devices include, ***but are not limited to:***

  - Manually-operated circuit breaker
  - Disconnect switch
  - Slide gate
  - Slip blind
  - Line valve
  - Block and similar device used to block or isolate energy
  - Manually-operated switch that disconnects circuit conductors from all ungrounded supply conductors

  Note: Push buttons and selector switches are NOT energy-isolating devices.

- Energy source -- any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, nuclear, or any other live or potential energy. Examples of energy sources include:

  - Electrical motors or pumps, electrostatic precipitators, heaters, and open bus work
  - Mechanical compressed gas, a tensioned spring, and a suspended load
  - Hydraulic starters on diesel-driven pumps (e.g., cooling water)
  - Chemical (flammable/combustible/corrosive) acids and caustics, and asphyxiating gases

- Thermal sources such as steam, condensate, and hot oil; liquefied gases (cold)

- **Lockbox** system -- system for locking out power, gravity, or hydraulic-driven internal equipment.

- **Lockout** -- the use of locks or other lockout devices to positively secure an energy-isolating device, such as a switch or valve; thereby controlling the hazardous energy or other hazard until the lockout device is removed.

- **Lockout device** -- a device that uses a positive means, such as a lock, to hold an energy-isolating device in the safe position to prevent energizing machines or equipment. Examples of lockout devices include: chains, padlocks, wedges, multi-lock devices, pins, blanks, bolted slip blinds, and plugs.

  Note: The use of combination locks is prohibited.

- **Maintenance and servicing** -- refers to constmcting, installing, setting up, and inspecting any and all work performed to keep a machine, process, or system in efficient operating condition. Includes repairing, adjusting, changing, cleaning, lubricating, and clearing jams and obstmctions to the normal flow of material.

- **Tagout** -- the placement of a tagout device on an energy isolating device (switch or valve), in accordance with an established procedure, to indicate that the switch or valve and the equipment being controlled cannot be operated until the tagout device is removed.

- **Tagout device** -- a prominent waming device, such as a tag securely fastened to an energy-isolating device (switch or valve), in accordance with an established procedure, to indicate that the switch or valve and equipment being controlled carmot be operated until the tagout device is removed.

  Tagout devices must be located on, or as close as safely possible to, the energy-isolating device (switch or valve), and in a position that is immediately obvious to anyone attempting to operate the device.

Messages written on the tag must remain legible under all conditions, and must provide adequate warning of hazards.

2.0 APPLICATION OF GUIDELINES

Lockout/tagout guidelines in this Standard apply (whether the equipment is electrical, hydraulic/pneumatic, or another type such as radioactive sources [e.g., tank level indicator] or spring-loaded) when:

- Maintenance or service of machines or equipment is performed, and a guard or other safety device is removed or bypassed.
- Any work is undertaken whereby an employee is placed in an unsafe area in which machines or equipment are operating or could be remotely started.
- When entering a confined or enclosed space in which valve lockout and blanking and blinding of piping (including lines to flare) are required.

Lockout/tagout guidelines do **NOT** apply for maintenance and/or service work on unplugged machines or equipment as long as:

- The employee performing the work has exclusive control of the plug.
- The plug is pulled from the wall and the male end is put on the equipment, readily visible to the person doing the work. *Note:* If this cannot be done, use lockout/tagout procedures.

Under certain conditions, some hot tap operations are also **NOT** covered by the guidelines in this Standard.

3.0 RESPONSIBILITY

Each of the following have specific responsibilities for lockout/tagout:

- Management and supervisors

- Workers
- Authorized employee

3.1 Management and Supervisors

Managers and supervisors must ensure that:

- Workers are trained in and follow lockout/tagout procedures.
- There are regular reviews of the guidelines and procedures in this Standard.
- Annual reviews are conducted on any equipment-specific procedures each worker uses. *Note:* If PTSI employees work on another company's equipment, they must follow one or the other's established lockout/tagout procedures, or come to a mutual understanding or which guidelines will be used. The PTSI supervisor must review and approve PTSI employees using another company's lockout/tagout procedure.

3.2 Workers

Each worker:

- In some jurisdictions, must work under the protection of their own assigned lock(s).
- Involved in maintenance or other work requiring lockout must personally lock the lockout points or a lockbox (keybox) before starting work, and remove his locks when his work is completed. *Note:* To ensure continuity of the lockout during a shift change, supervisors can apply their own lock(s) before workers coming off shift remove their locks, and workers coming on shift install their locks.

If a worker is unable to remove his assigned lock(s) and cannot be contacted, the manager and senior shift supervisor, or foreman (once satisfied that workers are not in danger) can personally remove the lock(s) using the master or spare key(s). The worker must be informed that this was done.

3.3 Authorized Employee

Once a year, or whenever there is a change in machines, process, or system, the authorized employee must review work-site lockout/tagout procedures to ensure that they are adequate.

4.0 REGULATIONS AND STANDARDS

Since regulations and standards may differ at each location, laws pertaining to lockout/tagout must be checked in each state and country.

5.0 LOCKOUT/TAGOUT DEVICES

In the context of this Standard, lockout/tagout devices are defined as:

- Singularly identified; the only device(s) used for controlling energy.
- Durable enough to withstand the environment for the maximum time that exposure is expected, and accidental removal is not probable.
- Standardized within the facility -- color, shape, and size; for tags print and format.
- Substantial -- Can only be removed by using excessive force or unusual techniques.
- Identifiable -- Indicates the employee applying the device(s) by name or number.

Locks must be:

- Of adequate strength and keyed to prevent removal, except by cutting tools or excessive force.
- Keyed differently (combination locks are NOT allowed).
- Given to a worker and operable only by that worker's key, or by a master or spare key in an emergency. Master or spare keys must be kept secure, accessible only to a foreman or supervisor for emergencies.

6.0 LOCKOUT/TAGOUT PROCEDURES

The basic lockout/tagout procedure involves the following six steps:

Important: Employees must follow the established, written lockout/tagout procedure during all maintenance activities in this sequence.

- Preparation
- Shutdown
- Isolation
- Lockout/tagout application
- Stored energy check
- Verification of isolation

6.1 Preparation

Prior to shutdown, the authorized employee must:

- Identify (and follow) the written lockout/tagout procedures for each piece of equipment.

- Identify the type and intensity (or magnitude) of the energy or hazards he must control.

- Identify the method or means of controlling the energy or hazards.

- Notify all affected employees of the extent and duration of the shutdown.

6.2 Shutdown

- Use the established, written procedures to turn off or shutdown the machines or equipment.

- Perform an orderly shutdown to avoid any additional or increased hazards to employees as a result of machine or equipment de-energization.

6.3 Isolation

General:

- Locate and operate all energy-isolating devices needed to control the energy to the machines or equipment and isolate them from the energy source(s).

- When practical, post the lockout/tagout procedure adjacent to the machine, process, or system.

Isolation of Electrical Equipment:

- Use the start/stop switch on a machine to turn it off and ensure that the machine is no longer rnning.

- Disconnect the machine from the power supply. When the machine uses a plug AND the worker can complete maintenance without leaving the

machine, place the male end of the plug on top of the machine, where it is readily visible to the person doing the work. If the employee performing maintenance could be interrupted, secure the plug with a lock.

- If the machine is supplied power from an electrical panel and ***CIRCUIT BREAKER***, find the correct breaker, switch it to the off position, and:

- Lock out the individual circuit breaker.

- Or if the individual breaker is not lockable, close and lock the panel door. Securely attach a tag to the door lock that identifies the worker who locked out the panel.

- Only lock the panel door if the door lock is operable using one employee's key and a master key for emergencies. When there is more than one employee involved in the work, secure the door key in a lockbox (keybox) system.

OR

If the machine is supplied power through a ***DISCONNECT SWITCH***, determine the correct disconnect and switch it to the off position, and apply:

- The safety lockout scissor-clip in the proper location,

And

- The worker's lock to the lockout scissor-clip. ***Important:*** Always stand to the ***hinged side*** of the door when opening or closing the switch.

<u>Isolation of **Piping Systems:**</u>

- When a piping system contains hazardous material, close and lock out the supply valve before work starts.

- Use suitable personal protective equipment where exposure to hazardous materials may occur.

- Where applicable, use PTSI's Hot Work/Vehicle Entry SOP or Confined Space Entry SOP.

  Note: In some situations/jurisdictions, a ***valve is*** not a suitable control device for hot work and/or confined space entry. And the piping system must be disconnected and blanked (a solid plate installed through a cross-section of the pipe) or blinded (a solid plate installed to block the end of the pipe).

Isolation of **Hydraulic/Pneumatic Equipment:**

- Authorized employee disconnects the electrical power to compressors and/or pumps.

- Close the main line feed valve, and bleed any residual or stored system pressure.

Note: Stored pressure can also be created by supporting something on a rod cylinder that may also require pins or blocks to immobilize the system. (In a lockout procedure that requires closing and locking a feed line, use caution to ensure that any resulting back pressure will not cause damage to the hydraulic pump.)

- The most common energy sources of this type are:

  - Push/pull rod cylinders
  - Rod motors

- When locking out hydraulic or pneumatic equipment, consider the following factors:

  - Accumulators
  - Reservoirs
  - Valve leakage
  - Bleeding

- Pinning and blocking
- Solenoid lockout is NOT acceptable

Other Energy Sources:

- Develop a list of "other" energy sources.
- Write specific lockout/tagout procedures for them.

Note: These could include, for example, tank level indicators containing a radioactive source.

6.4 Lockout/Tagout Application

- The ***authorized employee*** preparing the equipment applies the lockout device (lockout scissor-clip and his lock) to the energy-isolating device(s), so that it is held in the safe or off position.
- If a previously locked-out switch or panel does NOT have a safety lockout scissor-clip, contact the worker whose name appears on the lock. Both the authorized employee and the worker apply a safety lockout scissor-clip, then apply their assigned locks to the scissor-clip. ***Note:*** When many locks must be applied, use a lockbox (keybox) system.
- Each worker must apply his lock to each lockout point. An employee cannot borrow another person's lock(s), nor allow another person to borrow his assigned lock(s). If additional locks are required, obtain them from the supervisor and/or the authorized PTSI Representative. Make sure a label is attached to the lock, identifying who is using it.
- If there are a number of lockout points or the system is complicated, develop a checklist.
- Tagout devices must state that removal of the energy isolating device from the safe or off position is prohibited.

Important: Only the authorized employee, the worker who applied the tag, or in an emergency, a foreman or supervisor, can apply and remove lockout/tagout devices.

6.5 Stored Energy Check

- After application of lockout/tagout devices the energy isolating devices, all potentially hazardous energy must be relieved, disconnected, restrained, and otherwise made safe.
- Ground any residual electrical energy stored in capacitors.
- Use test equipment and/or visual checks to make sure all energy sources are neutralized.

6.6 Verification of Isolation

- Prior to beginning work on machines or equipment that are locked out or tagged out, the ***authorized employee*** preparing the equipment verifies completion of isolation and de-energization of the machines or equipment.
- If more than one person is applying locks, the person applying the first lock is responsible for ensuring that the locked-out machines or equipment cannot be operated.
- Make sure everyone stands clear, then operate the equipment controls to ensure the machine or equipment will not move.
- For work on electrical contact points, verification of isolation must include the use of a voltage tester by an electrician or authorized employee.

7.0 RELEASE FROM LOCKOUT/TAGOUT

Note: If it is necessary to test run the machine, equipment, or system, follow a "safe work" procedure to ensure safety.

Prior to release from lockout/tagout, follow these steps:

- Restore machines or equipment to an operational condition by:
  - Replacing or installing all components, including any guards or safety devices.
  - Making sure the equipment or process is free from any incomplete work, obstructions, or other unnecessary items.
- Direct employees to a safe area, and notify them that lockout/tagout devices are being removed.
- Each authorized employee who applies a device, should remove that lockout/tagout device. Make sure the authorized employee knows the sequence for lock removal and startup, especially if he is the employee removing the last lock(s).
- ***Important:*** Removal of the last lock is very serious in that prior to removing the last lock, the person responsible must ensure that the machine or equipment can be safely operated, and that all persons are clear. Employees are forbidden to remove locks or lockout scissor-clips that belong to other employees.
- Restore power to the machine or equipment.

Note: In an emergency, the authorized employee's supervisor, jointly with the senior manager on the shift (both must agree on the action to be taken), are the only persons authorized to remove locks that belong to other employees, and only after certain safeguards are met. The supervisor and manager must make every effort to:

- Verify that the authorized employee is NOT at the facility.

- Ensure that the original authorized employee is informed, that his lockout/tagout device(s) is removed before the employee returns to work.

  Note: Each site-specific plan must include procedures for release from lockout/tagout.
  Any emergency removal steps must be adequately documented, in writing, within the lockout/tagout procedure. The supervisor removing the lock(s) assumes full responsibility for removal, and must ensure that the machine(s) or equipment can be operated safely and will not endanger any employees.

8.0 INSPECTIONS

The ***authorized employee*** or ***supervisor*** must conduct a review of lockout/tagout procedures at least annually to ensure they are being carried out correctly.

8.1 Review of Procedures

The annual review of lockout/tagout procedures should include:

- The correction of any observed deviations or inadequacies.
- A review by an inspector of each authorized employee's responsibilities when using lockout/tagout.
- Certification of the review and documentation of appropriate information regarding the inspection.

Note: Certification identifies the machines or equipment on which lockout/tagout procedures were used, the date of inspection, employees included in the inspection, and the person performing the inspection.

8.2 Written Procedures

- Similar machines and/or equipment (such as those using the same type and magnitude of energy and the same or similar types of controls) can be covered with a single written procedure.

  Note: Exception: The employee need not document the required procedures for a particular machine or equipment, when all of the following elements exist:

  - The machines or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shut down which could endanger employees;
  - The machines or equipment has a single entry source which can be readily identified and isolated;
  - The isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment;
  - The machine or equipment is isolated from that energy source and locked out during service or maintenance;
  - A single lockout device will achieve a locked-out condition;
  - The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance;
  - The service or maintenance does not create hazards for other employees; and
  - The employer, in utilizing this exception, has had no accidents involving this unexpected activation or re-energization of the machine or equipment during service or maintenance activities.

9.0 TRAINING

To ensure that the purpose and function of the lockout/tagout procedures during maintenance and/or servicing are understood by all employees, and provide training to:

- Authorized employees
- Affected employees
- Other employees

Training can be accomplished through:

- In-house safety meetings
- On-the job training techniques

An experienced, knowledgeable, and qualified employee must conduct training.

9.1 Training Requirements

Training requirements include:

- Authorized Employee -- must be trained to recognize applicable hazardous energy sources, the type and magnitude of energy available in the workplace, as well as the methods and means necessary for energy isolation and control.
- Affected Employee -- must be instructed in the purpose and use of energy control procedures and devices.
- All Other Employees -- must be educated in the use of energy control procedures and be instructed that they are prohibited from starting up or re-energizing locked out or tagged out machines or equipment.

9.2 Employee Re-Training

Provide re-training for the authorized employee, affected employee, and all employees, as applicable, when:

- A change occurs in the energy control procedures.
- A change in job assignments, machine, equipment, or process presents a new hazard.
- An inspection reveals deviations from, or inadequacies in, the energy control procedures.

Re-training establishes employee proficiency and introduces new or revised energy control methods and procedures as necessary.

9.3 Training Documentation

Document all training and/or re-training. Include in the documentation:

- Employee names
- Dates of training
- Name of the trainer
- Items discussed in the training and/or re-training

10.0 ADDITIONAL REQUIREMENTS

Additional lockout/tagout requirements include:

- Temporary removal/testing
- Contractors
- Groups
- Shift or personnel changes

10.1 Temporary Removal/Testing

When machines or equipment must be tested and posifioned, lockout/tagout can be temporarily removed and re-installed using the following procedure:

- Clear the machines or equipment
- Remove employees to a safe area

- Remove lockout/tagout devices
- Energize and test the system
- De-energize the system and re-apply lockout/tagout devices

10.2 Contractors

When outside personnel (contractors) perform work within a PTSI facility, the on-site *authorized employee* and *authorized contractor employee* must inform each other of their respective lockout/tagout procedures. They must then work together to determine how best to integrate the two procedures, or mutually agree upon which set of procedures will be followed.

10.3 Groups

Except where specifically prohibited by law, a group of employees working on the same machines or equipment requiring lockout/tagout can use ***group*** lockout/tagout procedures if:

- The group procedures assure them the same level of protection as provided by a personal lockout or tagout device.
- They are doing ***one*** job under the direction of ***one*** supervisor.
- The authorized PTSI Representative assures there is the same level of protection for each employee.

Group lockout device -- a group lockout device refers to an attachment of more than one lockout device by more than one authorized employee to provide protection for a group of employees, working on the same machines or equipment. *Note: A* better altemative is to use a lockbox.

Group requirements -- an authorized employee:

- Has primary responsibility for a set number of employees, working under the protection of the group lockout/tagout device.

- Ascertains the hazards and exposure of each individual in the group with regard to the lockout or tagout of the machines or equipment.

- Coordinates affected employees and assigns job associated lockout/tagout controls to ensure continuity of protection of employees in the group.

- Affixes a personal lockout and tagout device to the group lockout device before beginning work, and removes the device upon stopping work on the machines or equipment.

10.4 Shift or Personnel Changes

During shift changes, adequately inform all incoming and outgoing employees of the lockout/tagout procedures that are in place to:

- Ensure continuity of the lockout/tagout procedures during and after shift changes.

- Provide an orderly transfer.

- Minimize exposure of employees to hazards, such as energizing, startup, and release of
- stored energy.

- Ensure lockout/tagout procedures remain intact.

1.0 SCOPE

This Personal Protective Equipment (PPE) Standard provides guidance for PPE including head protection, footwear protection, and eye protection. This standard does not set forth the PPE required for all situations, but rather addresses the minimum PPE requirements for PTSI employees. Additional PPE requirements will be set forth by the hazard assessment associated with the individual work areas.

This standard is not intended to be used in the place of applicable ANSI, OHSA or industry standards which should also be reviewed.

1.1 Policy Statement

Personal protective equipment should not be the only option considered for ensuring personal protection in a hazardous workplace. Considerations should also be given to workplace hazard assessments and engineering and administrative controls.

1.2 References

This Standard references, ***but is not limited to***:

- ANSI Standard Z89.1 specifications
- ANSI Standard Z87.1 specifications
- OSHA Standard 1910

1.3 Definitions

- ANSI – American National Standards Institute
- PPE – Personal Protective Equipment
- OSHA – Occupational Safety and Health Administration

2.0 HEAD PROTECTION

A workplace hazard assessment has been completed within the guidelines of the Personal Protective Equipment (PPE) regulations, which indicates that hard hats are not necessary for normal operations. Hardhats, which meet ANSI standard 289.1, are required for operations, construction, or maintenance projects that presents a hazard.

As a guideline, hard hats are not specifically required in:

- Offices
- Quality control laboratories
- Control rooms
- Motor vehicle garages
- Electrical or instrument shops
- Break rooms
- Enclosed cabs of motor vehicles
- Machine shops
- Welding shops
- Parking lots

Areas where hard hats are required should be clearly marked.

HARD HATS ARE REQUIRED AT ALL TIMES (EVEN IN EXCLUDED AREAS) IF THE WORK BEING PERFORMED PRESENTS A HAZARD!

3.0 FOOTWEAR PROTECTION

All employees, contractors, and visitors on PTSI property, right-of-way, construction, or maintenance projects are required to wear safety footwear.

3.1 Safety Footwear Criteria

- Safety footwear must have non-slip soles and leather uppers.
- The safety footwear must be worn while performing field work-site operations.
- Safety footwear may be slip-on or lace-up style.
- Sole material on safety footwear must be slip resistant and be made of non-leather material such as neoprene or polyurethane.
- Additional safety footwear requirements identified by a workplace hazard assessment will take precedence over the previously identified minimum standards.
- All safety footwear must have a normal, well-defined heel, separate from the sqle of the footwear. A riding style or wedge-type feel is not acceptable.
- Steel toes are required.

3.2 Safety Footwear Reimbursement

- A hull-time employee is eligible for $90 reimbursement toward the purchase of the first (one) pair of safety footwear, with employee purchasing any additional footwear thereafter.
- An additional employee reimbursement is allowed if decided by the operations manager due to special circumstances.

4.0 HAND PROTECTION

- Many injuries in the workplace happen because hand protection either is not worn or is inadequate for the type of hazard encountered. Each employer is required to choose, and require employees to use, appropriate hand protection.

- Hazards from which hands need to be protected include:

  - Skin absorption of harmful substances,
  - Severe cuts or lacerations,
  - Severe abrasions,
  - Punctures,

- Chemical bums,
- Thermal bums, and
- Harmful temperatures.

- Hand protection will be based on an evaluation of:

  - The tasks to be done
  - The work conditions (duration of use, and the hazards)
  - Potential hazards identified in the hazard assessment and communicated to each affected employee.

Example:

- Appropriate gloves offer protection against coarse or sharp-edged objects, chemicals, dirt, solvent, fuel, grease, and paint.
- Appropriate gloves also protect the hands from cold temperatures.
- Leather gloves provide increased gripping power, and protect hands when handling rough, abrasive, or sharp objects.
- Appropriate gloves should be wom for welding or torch operations.
- Cotton or canvas gloves provide sufficient protection for most light-duty work.
- Appropriately coated gloves will offer protection from petroleum products, solvents, and agricultural chemicals.
- Gloves should be cleaned thoroughly after contact with chemicals and before removal.
- Gloves should fit well.
  - Tight gloves interfere with dexterity and are uncomfortable.
  - Loose gloves are dangerous around moving machinery parts.

5.0 EYE PROTECTION

All employees, contractors, and visitors on PTSI property, right-of-way, constmction, or maintenance projects are required to wear approved safety glasses which meet ANSI Standard Z87.1 specificafions.

As a guideline, safety glasses are not required in:

- Offices

- Break rooms
- Enclosed cabs of motor vehicles
- Control rooms
- Parking lots

Other forms of eye and face protection, such as goggles, face shields, shaded lenses, chipping goggles, welding helmets, welding goggles, etc., are required for specific jobs where safety glasses with side-guards alone do not provide adequate protection.

Employees who wear contact lenses should consult their supervisor or safety person of potential job site hazards, such as dust, welding, chemicals, etc.

Areas where eye protection is required should be clearly marked.

EYE PROTECTION IS REQUIRED AT ALL TIMES (EVEN IN EXCLUDED AREAS) IF THE WORK BEING PERFORMED PRESENTS A HAZARD!!

5.1 Eye Protection Reimbursement

PTSI will provide one (1) pair of prescription safety glasses the first year, and will replace them on an as-needed basis.

Company-covered expenses include:

- All standard lens, single vision, bifocals, trifocals costs
- Side shields
- Replacement due to damage or prescription change
- Fitting of eye glasses

Employee expenses include:

- Eye examination to obtain prescription
- Any option or frame upgrade costs not included above

Note: Employees requiring a spectacle kit when using respirators, will be supplied one by the company.

6.0 HAZARD ASSESSMENT

A workplace hazard assessment will be completed within the guidelines of the Personal Protective Equipment (PPE) regulations, OSHA 1910.132. The Operations Manager (or Equivalent) is responsible for ensuring the completion of the assessment.

Key points from the OSHA 1910.132 regulation:

- The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE).
- The employer shall verify that the required workplace hazard assessment has been performed through a written certification that identifies the workplace evaluated; the person certifying that the evaluation has been performed; the date(s) of the hazard assessment; and, identify the document as a certification of hazard assessment.
- The employer shall verify that each affected employee has received and understood the required training through a written certitication that contains the name of each employee trained, the date(s) of the training, and that identifies the subject of the certification.

7.0 TRAINING 1910.132 (F) (1)

The employer shall provide training to each employee who is required by this section to use PPE.

- Each employee shall be trained to know least the following:
  - When PPE is necessary;
  - What PPE is necessary
  - How to properly don, doff, adjust, and wear PPE;
  - The limitations of the PPE; and,
  - The proper care, maintenance, useful life and disposal of the PPE.

- Each affected employee shall demonstrate an understanding of the training specified in paragraph 1910.132 (f) (1) and the ability to use PPE properly, before being allowed to perform work requiring the use of PPE.
- When the employer has reason to believe that any affected employee who has already been trained does not have the understanding and skill required, the employer shall retrain each such employee. Circumstances requiring retraining include, ***but are not limited to***:
  - Changes in the workplace render previous training obsolete; or
  - Changes in the types of PPE to be used render previous training obsolete; or
  - Inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill.
- The Employer shall verify that each affected employee has received and understood the required training through a written certification that contains the name of each employee trained, the date(s) of training, and that identifies the subject of the certification.

1.0 SCOPE

This standard operating procedure addresses the safety requirements relating to fire protection, design, maintenance and use of powered industrial vehicles at the facility. Powered industrial vehicles includes forklifts, tractors, platform lift trucks, motorized hand trucks, motorized boats and other specialized industrial trucks powered by electric motors or interual combustion engines.

1.1 References

This Standard references, ***but is not limited to***:

- FAMM Standard Facility Pracfice No. SFP-20

1.2 Definitions

- Powered Industrial Vehicle – refers to any industrial vehicle including forklifts, tractors, platform lift trucks, motorized hand trucks, motorized boats, and other specialized industrial trucks powered by electric motors or interual combustion engines. The term does not apply to vehicles intended primarily for earth moving or over-the-road hauling.

2.0 RESPONSIBILITIES

- It is the responsibility of the Facility Manager to ensure that the facility complies with the ruinimum standards defined by this Standard and all applicable national, state and/or local regulations.

3.0 GENERAL REQUIREMENTS

The following minimum standards for powered industrial vehicles shall apply to the facility:

- Careful consideration shall be given prior to purchase, lease, rental or otherwise placing into service any powered industrial vehicle to ensure that the design and classification of the vehicle is compatible with the hazards of the service. Such consideration shall include (but not be limited to):
  - Potentially explosive or ignitable atmospheres from flammable gases, liquids, air-borue dusts or fibers;
  - Source of ignition when used around flammable liquids or fiiels;
  - Overhead/falling hazards;
  - Area ventilation and the potential for exhaust fume buildup; and
  - Structural support of floors, walkways, ramps, bridges, etc.

- Any vehicle that leaves the company property must be properly licensed in the state in which it is located. Vehicles that remain on-site, such as the pump truck, need not be licensed.

- The brakes of roadway trucks/trailers and railcars shall be set and wheel blocks shall be placed under wheels to prevent the movement while they are boarded with a powered industrial vehicle for loading or unloading.

- Fire aisles, access to stairways, building egress routes, and flrefighting equipment shall not be blocked when parking a powered industrial vehicle.

- While traveling, the powered industrial vehicle shall be operated in a safe manner, at safe speeds, at a safe distance from other vehicles and equipment, and under full control of the operator.

- Powered industrial vehicles shall be examined at least once each day of operation before being placed into service. If the powered industrial vehicle is used 24 hours a day, it shall be examined at the end (or start) or each shift. A daily inspection checklist shall be completed and submitted to the terminal superintendent prior to use. The powered industrial vehicle shall not be placed into service if the examination reveals any condition adversely affecting the safety of the vehicle. Copies of the daily inspection checklists can be located in Appendix A.

- If at any time a powered industrial vehicle is found to be in need of repair, is defective, or in any way is unsafe, the vehicle shall be taken out of service and remain out of service until it has been restored to a safe operating condition. All repairs shall be made by authorized, qualified personnel or contractors.

- Contractors on site operating a powered industrial vehicle shall be responsible for the proper design, use, maintenance, inspection, training and operation of the powered industrial vehicles under their control.

- Facility managers shall ensure that employees who will operate the vehicles are properly trained and licensed.

- Unless otherwise specified by the conditions of operating licenses, training shall be performed prior to operation of the powered industrial vehicle for the first time. Operator proficiency shall be evaluated at least every three years thereafter, or whenever an operator is:
  - Involved in an accident or near miss;
  - Is observed to be operating the vehicle unsafely;
  - Is assigned to a new type of vehicle; or
  - Whenever workplace conditions change that could affect the safe operation of vehicles.

  Based on the results of such evaluations, retraining shall be provided on a case-by-case basis to ensure that operator proficiencies are properly maintained.

- Training must be specific to the powered industrial vehicle being operated. All training shall be documented and records shall be kept. Such records may include facility powered industrial vehicle examination logs, maintenance records, design specifications, training documents, and other documents.

4.0 PERFORMANCE MONITORING

Facility managers are responsible for performing or directing periodic self evaluations or facility inspections to ensure that the powered industrial vehicles program is being properly and effectively implemented. At a minimum, the facility shall:

- Ensure that powered industrial vehicles are properly designed for the areas in which they will be used;
- Perform periodic checks to ensure that only properly trained and licensed employees are operating the powered industrial vehicles and that the vehicles are being properly examined and maintained;
- Conduct a period review of the powered industrial vehicle training programs and training records;
- Take effective corrective and preventative action where deficiencies are observed.

1.0 SCOPE

Relief devices are used to prevent excessive pressure buildup within a vessel or system. This procedure has been developed to identify installation requirements, inspection requirements and testing requirements.

1.1 References

This standard references, ***but is not limited to***:

- API Recommended Practice 520; Sizing, Selection and Installation of Pressure-Relieving Devices in Refineries

1.2 Definitions

- Accumulation – The pressure increase over the maximum allowable working pressure allowed during discharge through the pressure relief device.
- Blowdown – The difference between the set pressure and the closing pressure of a pressure relief valve.
- Maximum Allowable Working Pressure (MAWP) – The maximum gauge pressure permissible in a pipe or vessel in its normal operating position at the designated coincident temperature specified for that pressure. The MAWP is the basis for the pressure setting of the pressure relief devices that protect the pipe or vessel.
- Maximum Operating Pressure – The maximum pressure expected during normal system operation.
- Overpressure – The pressure increase over the set pressure of the relieving device allowed to achieve rated flow. It is the same as accumulation only when the relieving device is set to open at the maximum allowable working pressure.
- Pressure relief device – Actuated by inlet static pressure and designed to open during emergency or abnormal conditions to prevent a rise of internal fluid pressure in excess of a specified design value. The device also may be designed to prevent excessive internal vacuum. The device may be a pressure relief valve, a non-reclosing pressure relief device, or a vacuum relief valve.

- **P**ressure relief valve – A pressure relief device designed to open and relieve excess pressure and to reclose and prevent the further flow of fluid after normal conditions have been restored.
- **R**ated **R**elieving **C**apacity – the relieving capacity used as the basis for the application of a pressure relief device.
- **R**elief **V**alve – A spring loaded pressure relief valve actuated by the static pressure upstream of the valve. The valve opens normally in proportion to the pressure increase over the opening pressure. A relief valve is used primarily with incompressible fluids.
- **S**afety **V**alve – A spring loaded pressure relief valve actuated by the static pressure upstream of the valve and characterized by rapid opening or pop action. A safety valve is normally used with compressible fluids.
- **S**afety **R**elief **V**alve – A spring loaded pressure relief valve that may be used as either a safety or relief valve depending on the application.

2.0 GENERAL INFORMATION

- A conventional pressure relief valve is a self-actuated spring-loaded pressure relief valve which is designed to open at a predetermined pressure and protect a vessel or system from excess pressure by removing or relieving fluid from that vessel of system.
- **P**ressure relief valves designed for liquid service applications typically will suddenly surge to 50%-100% lift at **2**%-6% overpressure. As the overpressure increases, these forces continue to grow, driving the valve into hull lift.
- **L**iquid service valves, capacity certified by ASME, are required to reach full rated capacity at 10% or less overpressure.

3.0 SIZING REQUIREMENTS

- To establish the size and design of a pressure relief device, the designer must first determine the conditions for which overpressure protection may be required.
- The contingencies that may cause overpressure must be evaluated in terms of the pressures generated and the rates at which fluids must be relieved. The process flow diagram, material balance, and piping and instrument diagrams are needed to calculate the individual relieving rates for each pressure relief device.

3.1 Back Pressure

- Back pressure must be taken into consideration when selecting a pressure relief device. Effects due to back pressure may include variations in opening pressure, reduction in flow capacity, instability, or a combination of all three.
- Back pressure which is present at the outlet of a pressure relief device when it is required to operate is defined as superimposed back pressure.
- Superimposed back pressure at the outlet of a conventional spring loaded pressure relief valve acts to hold the valve disc closed with a force additive to the spring force. The actual spring setting should be reduced by an amount equal to the superimposed back pressure to compensate for this.
- Back pressure which develops in the discharge system after the pressure relief valve opens is defined as built-up back pressure.
- Excessive built-up back pressure can cause the valve to operate in an unstable manner, which could occur as flutter or chatter. This could cause damage to the valve and the interconnecting piping.
- Balanced pressure relief devices should be used where the built-up back pressure is too high for conventional pressure relief valves or where the superimposed back pressure varies widely compared to the set pressure.
- Balanced pressure relief devices can be used where the total back pressure does not exceed 50% of the set pressure.

3.2 Relieving Pressure

- The relieving pressure is the inlet pressure of the pressure relief device at relieving conditions. The relieving pressure is the total of set pressure plus overpressure.
- Table 1 summarizes the maximum overpressure and set pressure for pressure relief valves specified in accordance with the ASME Code.

Table 1—Set Pressure and Accumulation Limits for Pressure Relief Valves

Contingency	Single-Valve Installations		Multiple-Valve Installations	
	Maximum Set Pressure (percent)	Maximum Accumulated Pressure (percent)	Maximum Set Pressure (percent)	Maximum Accumulated Pressure (percent)
Nonfire Cases				
First valve	100	110	100	116
Additional valve(s)	—	—	105	116
Fire Case				
First valve	100	121	100	121
Additional valve(s)	—	—	105	121
Supplemental valve	—	—	110	121

Note: All values are percentages of the maximum allowable working pressure.

- In accordance with ASME Code, Section VIII, Division 1, accumulated pressure shall be limited to 110% of the MAWP in vessels or systems that are protected by a single pressure relief device. The set pressure shall not exceed the MAWP.
- A multiple device installation requires the combined capacity of two or more pressure relief devices to alleviate a given overpressure contingency.
- For further instruction on sizing pressure relief devices, please refer to Section 3.8 of API RP 520.

4.0 INSTALLATION REQUIREMENTS

- Pressure relief devices should be installed on any vessel or system that is subject to overpressure whether by flow conditions, thermal expansion, or any other source.
- A common application of pressure relief devices is in sections of pipe left full of product that can potentially be blocked off on both ends. In such cases pressure relief devices should be installed to prevent overpressure caused by thermal expansion.

4.1 Vibration considerations

- Vibrations may cause leakage at the seat of a pressure relief valve, premature opening, or premature fatigue failure of certain valve parts, inlet and outlet piping, or both.

- Detrimental effects of vibrations can be reduced by minimizing the cause of vibrations, by additional piping support, or by providing greater pressure differentials between the operating pressure and the set pressure.

4.2 Pressure Drop limitations and Piping Configurations

- Excessive pressure loss at the inlet of a pressure relief valve can cause rapid opening and closing of the valve, or chattering. Chattering will result in lowered capacity and damage to the seating surfaces.
- When a pressure relief valve is installed on a line directly connected to a vessel, the total non-recoverable pressure loss between the protected equipment and the pressure relief valve should not exceed 3% of the set pressure of the valve.
- Pressure losses can be reduced by rounding the entrance to the inlet piping, by reducing the inlet line length or by enlarging the inlet piping.
- The nominal size of the inlet piping must be the same as or larger than the nominal size of the pressure relief valve inlet flange connection.
- Avoid the installation of a pressure relief valve at the end of a long horizontal inlet pipe through which there is normally no flow. Foreign matter may accumulate, or liquid may be trapped, creating interference with the valve's operation or requiring more frequent valve maintenance.
- The inlet piping system to relief valves should be freedraining from the pressure relief device to prevent accumulation of liquid or foreign matter in the piping.
- When discharge piping for pressure relief valves is designed, consider the combined effect of superimposed and built-up back pressure on the operating characteristics of the pressure relief valves.
- The rated capacity of the pressure relief valve shall be used to size the discharge line from the pressure relief valve to the relief header.

4.3 Stop valves

- Block valves may be used to isolate a pressure relief device from the equipment it protects or from its downstream disposal system. Since improper use of a block valve may render a pressure relief device inoperative, the design, installation and management of these valves should be carefully evaluated to ensure that plant safety is not compromised.

- This design strategy permits the pressure relief device to be inspected, maintained, or repaired without shutting down the equipment.
- All isolation valves located in relief system piping shall meet the following requirements:
  - Valves shall be full bore.
  - Valves shall be suitable for the line service classification.
  - Valves shall have the capability of being locked or carsealed open.
  - When gate valves are use, they should be installed with stems oriented horizontally, or if this is not feasible, the stem could be oriented downward to a maximum of 45 degrees from the horizontal to keep the gate from falling off and blocking the flow.
- Opening and closing of the isolation valves shall only be done by an authorized person.

4.4 Mounting Position

- Pressure relief valves should be mounted in a vertical upright position.

5.0 INSPECTION REQUIREMENTS

- For optimum performance, pressure relief devices must be serviced and maintained regularly.
- Inspect pressure relief devices annually.
- In accordance with Coast Guard requirements, all pressure relief devices on docklines shall be checked annually.

6.0 TESTING REQUIREMENTS

- Pressure relief devices must be taken out of service in order to determine that the devices are working properly.
- Standard policy shall be to take pressure relief devices out of service one at a time.
- The following general steps shall be followed when removing a pressure relief device from service.
  1. Steam tracing to the affected area of pipe must be tumed off to prevent expansion of the product in the pipe.
  2. The affected area of pipe shall not be blocked in.
  3. The valves on either side of the relief device shall be closed.
  4. The relief device shall be removed.

5. Once the relief device has been removed, it can be tested in one of two ways. Either the pressure relief device shall be sent to a repair shop to be tested by a licensed operator, or the device can be tested on site by facility personnel with the aid of an air compressor.
6. Facility personnel shall build up pressure on the inlet of the relief device until the device pops. Personnel shall record the pressure at which the valve releases in the logbook.
7. Relief devices that fail to release at the rated level shall be sent to a repair shop.

1.0 SCOPE

The purpose of this program is to ensure that PTSI employees are properly protected from airborne chemical hazards during their work activities. This is typically accomplished by using accepted engineering controls such as general and local exhaust ventilation. When engineering controls are not feasible or while they are being instituted, or in an emergency, appropriate respirators may be used only by employees who have been medically evaluated, trained, fit-tested and certified in their use and limitations.

This program applies to all employees who are required to wear respirators during their normal work activities and during emergencies. Any employee who asks to wear a respirator when one is not required (voluntary use) must comply with the medical evaluation, cleaning, maintenance, and storage requirements of this program. Any employee who asks to wear a filtering facepiece (dust mask) is not subject to the medical evaluation, cleaning, maintenance, and storage requirements of this program.

2.0 RESPONSIBILITIES

- The Terminal Manager shall be responsible to:
  - Provide commitment and leadership to adhere to the requirements of the PTSI Respiratory Protection Program by assuming the role of Program Administrator.
  - Determine areas where respiratory protection may be required.
  - Provide direct-reading air monitors to enable employees to evaluate the need for respiratory protection while on the job.
  - Assist with the selection and procurement of respirators.
  - Conduct an annual review of the program to ensure its effectiveness.
- Each Terminal Supervisor shall be responsible to:
  - Identify persons who are working in areas where respiratory protection is required and initiate the request for respirator issue.

- Ensure that employees are medically able to wear respirators before assigning them to tasks requiring the use of a respirator.
- Ensure that employees are properly instructed in the use and maintenance of their respirator and fit-tested before using a respirator.
- Ensure that any person assigned to use a respirator is fully informed of the nature of the hazard.
- Ensure that employees maintain all required respiratory protection devices in good repair and in a clean and sanitary condition.
- Conduct regular inspections and evaluations to determine the continued effectiveness of the program.

- Employees who wear respirators shall be required to:

  - Use assigned respirators in accordance with instructions and training received.
  - Inform their supervisor of any personal health problems that could be aggravated by the use of respirators.
  - Maintain their respirator in good repair and use fresh filters, chemical cartridges and/or canisters of the appropriate type.
  - Report immediately to their supervisor any damaged, defective or malfunctioning respirator.
  - If the respirator malfunctions while in use, go to a safe area and not remain in a hazardous atmosphere.
  - Not disassemble or alter a respirator other than to change cartridges/canisters or to clean it.
  - Not share or give their respirator to another employee to use.
  - Remain clean-shaven so that a facepiece-to-face seal can be obtained.
  - Take reasonable periodic breaks to rest and to wash the facepiece of it needs cleaning when wearing a respirator in a hazardous area.

- A licensed health care professional has been assigned the responsibility of confirming that each person is physically able to perform assigned work while using a respirator.

3.0 PROCEDURES

3.1 Hazard Evaluation

- Each terminal supervisor will identify and evaluate all workplace respiratory hazards by means of a Hazard Assessment

- The Hazard Assessment will include a reasonable estimate of employee exposures to the hazards and the identity of each hazard's chemical state and physical form.

- The information obtained from the Hazard Assessment will be used to select and assign respirators to employees.

3.2 Selection of Respirators

- The Terminal Manager will select respirators by determining whether there is either a potential for employees to be exposed above any OSHA exposure limit or there is a specific reason that an employee needs such protection.

- If the exposure cannot be reduced below the exposure limit, the Terminal Manager will select a respirator based upon: chemical toxicity, maximum expected concentration, oxygen deficiency, chemical warning properties, sorbent limitations, facepiece fit, mobility requirements, and type of use (routine, escape, or emergency entry).

- The Terminal Manager is responsible for selecting the appropriate respirator filters, cartridges, and/or canisters based on a review of material safety data sheets (MSDS) or other relevant air contaminant data.

- Only respirators approved by the National Institute for Occupational Safety and Health (NIOSH) shall be used.

- Only filters, chemical cartridges and/or canisters matched to expected atmospheric contaminants known to be present at terminal facilities will be used.

- Air-purifying respirators shall not be used in oxygen deficient atmospheres. Only atmosphere supplying respirators (SCBA, or air-

supplied) are approved for these conditions, and will not be used at terminal facilities.

- Respirators will not be assigned to individuals who cannot attain a proper fit or when facial hair prevents obtaining a good face seal.

- Consideration must be given to the limitations of the protective device and the work environment in which it will be used.

TABLE 1: RESPIRATOR SELECTION CRITERIA	
Type of Exposure:	Selection Procedure:
Particulate exposure	Respirators will be selected on the basis of potential oil mist exposure (N, R or P), severity of the inhalation hazard (95%, 99% or 100% efficient), air particulate concentration, and the availability of 21% oxygen.
Vapor and gas exposure	Respirators will be selected on the basis of chemical composition, physical state (vapor or gas), air contaminant concentration, and the availability of 21% oxygen.

The Terminal Manager shall rely on the current NIOSH-assigned protection factors (APF) when selecting respirators.

4.0 MEDICAL SURVEILLANCE

- Every employee who is required to wear a respirator, or who requests an air-purifying respirator, shall be medically evaluated before being fit-tested.

- The Terminal Manager or designee will make an appointment for each employee to have a medical evaluation by a licensed health care professional.

- Employees will fill out the OSHA Respirator Medical Evaluation Questionnaire during normal working hours and present to the licensed health care professional conducting the evaluation. It is a confidential document and supervisors may not review it.

- The medical questionnaire will by administered annually.

- The Terminal Manager will provide the licensed health care professional with the following information:

  - The type and weight of the respirator each employee will use,
  - The duration and frequency of use,
  - The expected physical work effort,
  - Any other protective clothing and equipment wom,
  - Temperature and humidity extremes at the workplace, and
  - Air contaminants and concentration levels that each employee may encounter.

- The licensed health care professional will discuss the results of the evaluation with the employee and provide a written determination to the Terminal Manager. This determination will not contain confidential medial information, but will include:

  - An opinion regarding the employee's ability to tolerate a respirator,
  - Any limitations on respirator use,
  - Any need for follow-up evaluations, and
  - A statement that the employee has been informed of the determination.

- If the licensed health care professional recommends altemative respiratory protection, such as a powered air-purifying respirator, the Terminal Manager will comply with the recommendation.

- Employees will receive follow-up medical evaluations under the following conditions:

- The employee reports medical signs or symptoms related to respirator use,
- A reevaluation is recommended by a supervisor, the Terminal Manager or the licensed health care professional,
- A fit-test or other program information indicates a need for reevaluation; and
- When changes in the workplace increase respiratory stress on an employee.

5.0 FIT-TESTING

- All employees using a tight-fitting facepiece respiratory must pass an appropriate qualitative fit-test (QLFT) or quantitative fit-test (QNFT).

- The Terminal Manager will determine which test is appropriate for each type of respirator.

- Qualitafive fit-testing shall be performed with the use of irritant smoke or Bitrex, and testing procedures shall conform to the protocols found in CFR 1910.134, Appendix A.

- A qualitative fit-test will be used only to fit-test negative pressure air-purifying respirators that achieve a fit factor of 100 or less.

- Employees must be fit-tested before they use a respirator for the first time, whenever they use a different respirator facepiece, and after any changes in their physical condition that could affect respirator fit.

- Fit-tests will be administered using the employee's assigned respirator or from a selection of respirators set up for fit-testing purposes (for an initial fit-test).

- All employees must be fit-tested annually.

6.0 RESPIRATOR USE

- Using tight-fitting respirators:
  - Employees who have beards or other conditions that interfere with the face-to-facepiece seal or valve function can not wear tight-fitting respirator face-pieces.
  - PPE or clothing that interferes with the face-to-facepiece seal or valve function is not permitted.
  - Corrective lenses with temple bars or straps that interfere with the face-to-facepiece seal cannot be used with any respirator.
  - Employees shall be instmcted on how to perform a positive pressure and negative pressure seal check whenever they don the device.

- Maintaining respirator effectiveness:
  - The Terminal Manager will monitor and reevaluate the effectiveness of the employees' respirators after any significant changes in work conditions or exposure levels.

- Employees must leave the areas in which they wear respirators, and may not retum until they replace or repair their respirator:
  - If they detect facepiece leaks or changes in breathing resistance;
  - To change respirators, filters, cartridges, or canister elements;
  - To wash their faces and respirator face-pieces as necessary to prevent eye; or
  - If they experience skin irritation.

- Respirators will not be used to enter IDLH atmospheres. If an IDLH atmosphere is known or suspected, employees will report the condition to their supervisor, but will not enter the area or confined space where the IDLH atmosphere exists.

7.0 RESPIRATOR MAINTENANCE AND CARE

- Respirators must be washed, cleaned, sanitized and inspected according to the manufacturer's instmctions:

  - Before any new respirator is used,
  - After each use, and
  - When respirators are used for fit-testing.

- Warm water with a mild detergent is used for cleaning air-purifying respirators. All parts should be allowed to dry thoroughly before reassembling.

- Employees must inspect their respirators before they use them and after they clean them. Inspection includes:

  - A check of respirator function,
  - Tightness of connections,
  - Condition of the elastomeric facepiece,
  - Head straps,
  - Valves,
  - Connecting tubes, and
  - Cartridges, filters or canisters.

- Only trained employees can replace wom or deteriorated respirator parts. All repair work, adjustments, and replaced parts must comply with the respirator manufacturer's instmctions.

- Air-purifying respirators are to be stored by the user in a bag or box such that the device is kept clean and dry away from contamination and sunlight.

- Replacement parts, such as filters, cartridges, and valve assemblies, shall be kept in a central location in each department.

- Respirators used in emergency situations shall be inspected at least monthly, in accordance with the manufacturer's recommendations, and checked for proper function before and after each use.

8.0 IDENTITY OF FILTERS, CARTRIDGES, AND CANISTERS

- All filters, cartridges, and canisters must be maintained as received from the manufacturer or supplier and be labeled and color-coded with the **NIOSH** approval label.

- The label on a cartridge, filter or canister cannot be removed and must remain legible.

- Defective filters, cartridges, and canisters cannot be used and must be removed from service.

9.0 TRAINING

- Before any employee wears a respirator for the first time, they must receive and understand training that covers:

  - What is the hazard and why a respirator is necessary,
  - How improper fit, use or maintenance can compromise the protective effects of the respirator,
  - The respirator's capabilities and limitations,
  - How to use the respirator in emergency situations, including situations in which the respirator malfunctions,
  - How to inspect, put on, check the seals, and remove the respirator,
  - Proper maintenance and storage procedures, and
  - How to recognize medical signs and symptoms that may limit or prevent effective use of the respirator.

- A person designated by the Terminal Manager will provide training, which will be fully documented, certifying that the employee understands the concepts presented and has demonstrated how to use and wear the respirator.

- The training must give each user an opportunity to handle the respirator; to have it fitted properly; to test the facepiece-to-face seal; to wear it in normal air for a trial period; and to wear it in a test atmosphere.

- Retraining must be performed at least annually or as deemed necessary by the Terminal Manager.

- Employees who ask for and are permitted to wear respirators must first read the information contained in CFR 1910.134, Appendix D.

10 PROGRAM EVALUATION

- The Terminal Manager will evaluate this program annually or as often as necessary to ensure that it remains effective.

- The Terminal Manager will consult employees about respirator fit, selection, proper use and maintenance, and will make periodic workplace observations to confirm that respirators are being used and maintained correctly.

11 RECORD KEEPING

- The Terminal Manager will maintain records of non-confidential medical evaluation determinations, fit-testing, training documentation, and annual inspection audits and make them available to employees and to OSHA.

1.0 SCOPE

This standard operating procedure addresses the general requirements for vehicle safety mles, training and enforcement at facilities operated by Pacific Terminal Services.

1.1 References

This Standard references, ***but is not limited to***:

- FAMM Standard Facility Practice No. SFP-29

1.2 Definitions

- Vehicle – refers to any car, van, tmck, forklift, boat, or other motorized conveyance that is brought onto facility premises by an employee, contractor or visitor.

2.0 RESPONSIBILITIES

- It is the responsibility of the Facility Manager to ensure that the facility complies with the minimum standards defined by this Standard and all applicable national, state and/or local regulations.

3.0 GENERAL REQUIREMENTS

The following minimum standards for vehicle safety shall apply to the facility:

- The maximum speed limit within the facility shall be 15 miles an hour;
- Traffic wamings shall be clearly posted using familiar signage conventions;
- Seatbelts shall be wom in cars and tmcks, at all times while on the facility premises and/or while operating a company-owned vehicle;
- Manufacturer-installed safety devices shall not be removed from company-owned vehicles;

- Vehicle operators shall be personally responsible for the safe operation of the vehicle they are using;
- All vehicle operators shall have and maintain active driving licenses;
- Appropriate vehicle safety and operator training shall be provided as a condition for authorization to drive a company-owned vehicle;
- Contractors operating vehicles at the facility shall comply with all of the above facility rules, and shall be certified or licensed to drive the type of vehicles operated on facility property.

4.0 GENERAL HAZARDS

- Be aware of pedestrians while operating a vehicle.
- Look for truck traffic and rail traffic before crossing intersections or rail tracks.
- When transporting oil samples, make sure samples are capped and sealed and stored in a secure manner.

5.0 PERFORMANCE MONITORING

Facility managers are responsible for performing or directing periodic self-evaluations or facility inspections to ensure that the vehicle safety program is being properly and effectively iruplemented. At a minimum, the facility shall:

- Ensure that the vehicle safety program is being properly and effectively implemented;
- Perform periodic checks to ensure that only properly trained and licensed employees are operating vehicles on facility property
- Take effective corrective and preventative action where deficiencies are observed.

1.0 SCOPE

This program establishes the methods and procedures to provide for the safety and health of employees working during confined space entry operations.

1.1 References

This Standard references, ***but is not limited to:***

- American National Standards Institute (ANSI) Z88.2-1980, "Practices for Respiratory Protection"
- American National Standards Institute (ANSI) Z117.1-1989, "Safety Requirements for Confined Spaces"
- American National Standards Institute (ANSI) Z244.1-1982, "Lockout/Tagout of Energy Sources"
- PSTI Lockout/Tagout SOP
- PSTI Respiratory Protection SOP
- OSHA Standards for Lockout/Tagout, 29 CFR 1910.147
- OSHA Standards for Permit-Required Contined Spaces, 29 CFR 1910.146, Federal Register, Vol. 58, No. 9, January 14 1993

1.2 Definitions

(For more information, see 29 CFR 1910.146)

- ACGIH TLVs – refers to the occupational exposure limits or "Threshold Limit Values" as published and updated yearly by the American Conference of Governmental Industrial Hygienists. **NOTE: These numbers are NOT absolute safe limits, only guidelines.**
- ANSI (American National Standards Institute).

- **APR** (Air **P**urifying **R**espirator) – Filters ambient air by absorbing vapor contaminants with a chemical cartridge, or by trapping particles between fibers.

- Attend**a**nt – An individual stationed outside one or more permit-required confined spaces who monitors the authorized entrants and who performs all attendant duties assigned in the employer's confined space program. Also called a standby person.

- Authorized entrant – An employee who is authorized by the employer to enter a permit space.

- Acceptable entry conditions – The conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

- **B**lanking or **B**linding – The absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore of the pipe, line, or duct with no leakage beyond the plate.

- **B**reathing air (minimum of Class D) – Air that meets the requirements of ANSI Z88.2-1980 or CSA Standard, CAN3-Z180.1-M85, "Compressed **B**reathing Air and Systems."

- Con**f**ined Space – Any space or enclosure that:

  - Is large enough and so configured that an employee can enter and perform assigned work;
  - Has limited or restricted means of entry or exit;
  - Is not designed for continuous employee occupancy.
  - May contain hazards capable of causing death or serious physical harm such as:
    - Containing or having the potential to contain a hazardous atmosphere.

- Containing a material that has the potential for surrounding and effectively capturing an entrant by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death.
- Containing any other recognized serious safety or health hazard.

Examples of confined spaces include, but are not limited to:

- Closed or open tanks;
- Vessels;
- Pits;
- Tanks cars/trucks;
- Storage tanks;
- Attics;
- Valve boxes;
- Excavations, trenches, and holes four feet or more in depth or that may contain specific hazards detailed in this program.

- Constant flow airline respirator – Half face or full-face respirator, supplied with Grade D breathing air at a continuous flow. This equipment is **NOT** approved for rescues or use in IDLH atmospheres.

- **D**econtamination – The removal of hazardous materials from a confined space, while maintaining adequate ventilation to allow employees to safely work in the confined space without the need for special protective equipment.

- **E**mergency – Any occurrence, including any failure of hazard control monitoring equipment, or event inside or outside a permit space that could endanger entrants.

- **E**ngulfment – The surrounding and effective capture, of a person by a liquid, or finely divided (flowable) solid substance that can be aspirated and cause death by filling or plugging the respiratory system, or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

- **E**ntry -- The action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities

in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

- Entry permit – A written or printed document provided by PSTI to allow and control entry into a confined space. The entry permit contains specific confined space entry information.

- Entry supervisor – Means the person (such as the employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section.

  NOTE: An entry supervisor also may serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as result by this section for each role he or she fills. Also, the duties of entry supervisor may be passed from one individual to another during the course of an entry operation.

- **Flammable** or explosive atmosphere – An atmosphere containing a flammable gas or vapor at a concentration between the lower explosive limit (LEL) and the upper explosive limit (UEL).

- **Hazard** – A source of danger that could result in illness, injury, or death to an individual, or other loss (e.g., oxygen deficiency, toxic vapors, fire, electrical shock, chemicals, or falls).

- **Hazardous** atmosphere – An atmosphere that may expose employees to the risk of death, incapacitation, impairment of the ability to self-rescue (escape unaided from a confined space), injury, or acute illness from one or more of the following causes:

  - Atmospheric oxygen concentration below 19.5% or above 23.5%.
  - Flammable gas, vapors, or mist in excess of 10% of its LEL.
  - Airborne combustible dust at a concentration that meets or exceeds its lower flammable limits (e.g., grain dust, coal dust, coke dust).
  - Atmospheric concentrations of any substance for which a dose or a TLV or PEL is published.

- Any other atmospheric condition that is immediately dangerous to life or health (IDLH).

- **Hot Work/Vehicle Entry Permit** – A permit that must be completed for any work that could create a source of ignition, such as welding, cutting, riveting, buming, heating, grinding, or vehicle ignition system.

- **Immediately Dangerous to Life or Health (IDLH)** Atmosphere – Any condition that poses an immediate or delayed threat to life, that would cause irreversible adverse health effects, or interfere with an individual's ability to escape unaided from a confined space.

- **Inerting** – The displacement of the atmosphere in a confined space by a non-combustible gas (such as nitrogen) to such an extent that the resulting atmosphere is non-combustible. **NOTE: This procedure produces an IDLH oxygen-deficient atmosphere.**

- **Isolation** – The process by which a confined space is removed from service and completely protected against the release of energy and material into the space by such means as:

  - Blanking or blinding
  - Misaligning or removing sections of lines, pipes, or ducts
  - Lockout and Tagout of all sources of energy
  - Blocking or disconnecting all mechanical linkages

- **Line breaking** – The intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

- **LEL** (Lower Explosive Limit) – Lower flammable limit of a vapor or gas; the lowest concentration (lowest percentage of the substance in air) that will produce a flash of fire when an ignition source (heat, arc, or flame) is present. At concentrations lower than the LEL, the mixture is too "lean" to bum.

- **Lockbox** – system for locking out power, gravity, or hydraulic-driven intemal equipment.

- Lockout/Tagout – Procedure that ensures all energy sources for electrical or rotating equipment and all isolating valves for gas, propane, crude, flare gas, etc. are locked in the off or valve-closed position. Prevents equipment from starting up or releasing any energy or product into a confined space while employees are present. Placement of locks and chains on valves and switches (preferably more than one) by an operations or maintenance representative, or each employee in a confined space, so only the key holders(s) can open them. Placement of tags which indicate the name of the person(s) doing the work, and the date and time of the work.

- MSDS – (Materials Safety Data Sheet).

- MSHA – (Mine Safety and Health Administration).

- Non-permit confined space – means a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

- OEL (Occupational Exposure Limit) – Canadian term, see PEL

- Oxygen Deficient Atmosphere – An atmosphere containing less than 19.5% oxygen by volume.

- Oxygen Enriched Atmosphere – An atmosphere containing more than 23.5% oxygen by volume.

- PEL (Permissible Exposure Limit) -- Exposure limit established by OSHA. This is the 8-hour TLV-TWA limit, or a maximum concentration an employee may be exposed to for 8 hours per day during a 40-hour workweek. (Normally, ACGIH TLV values are used instead of OSHA's PEL because they are more stringent. Use lowest exposure value.)

- Permit-required confined space (permit space) – A confined space that has one or more of the following characteristics:

  - Contains or has a potential to contain a hazardous atmosphere;

- Contains a material that has the potential for engulfing an entrant;
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- Contains any other recognized serious safety or health hazard.

- **Permit-required confined space program (permit space program)** – The employer's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

- **Permit system** – PTSI's overall program for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

- **Positive Pressure (pressure demand)** – Full face supplied air or SCBA respirator that maintains a positive pressure inside the facepiece greater than the atmospheric pressure. **This type of equipment is required for rescue and <u>ALL</u> IDLH atmospheres.**

- **PPE (Personal Protective Equipment)**

- **Rescue services** – The personnel/organization designated to rescue employees from a confined space.

- **Retrieval system** – Equipment, including a retrieval line, chest or full-body harness, wristlets (if appropriate), and a lifting device or anchor, used for non-entry rescue of person from a confined space.

- SA (Supplied Air) respirator – Pressure demand supplied with Grade D breathing air and full face-piece equipped with a five-minute egress bottle that allows the wearer access to IDLH atmospheres.

- SCBA (Self Contained Breathing Apparatus) – Self-contained breathing system that provides compressed Grade D breathing air through a positive pressure regulator to a full face-piece.

- Standby person – See Attendant

- TLV – (Threshold Limit Value) – Term used by ACGIH to express the airbome concentrations of a material to which nearly everyone can be exposed to day after day without adverse effects.

- TLV-TWA -- The allowable time-weight average concentration for a normal 8-hour workday or 40-hour week.

- UEL (Upper Explosive Limit) – Upper Flammable limit of a vapor or gas; the highest concentration (highest percentage of the substance in air) that will produce a flash of fire when an ignifion source (Heat, arc, or flame) is present. At concentrations higher than the UEL, the mixture is too "rich" to bum.

2.0 RESPONSIBILITIES

The following personnel are responsible for safe confined space entry:
- Facility Manager
- Terminal Manager

2.1 Facility Manager

It is the responsibility of the facility manager to ensure:

- The facility complies with the minimum standards as defined by this SOP and all applicable nafional, state and local regulations.
- That all affected employees have received proper training in confined space entry.
- The safety of persomel by periodically reviewing with them all procedures, making changes as necessary to maintain compliance with regulatory agencies.

2.2 Terminal Manager

It is the responsibility of the terminal manager to ensure:

- Anyone required to work in a confined space is medically fit and properly trained, including trained in the use of protective equipment.

- That all equipment necessary for eliminating exposure of employees to toxic materials is available at the work-site and employees use it.

3.0 GENERAL REQUIRMENTS

General requirements for safe confined space entry are:

- A pre-entry safety meeting must be held to inform all employees connected with or performing the work in a confined space of:
  - The hazards they may encounter.
  - Precautionary measures required.
  - Rescue measures needed in an emergency.

- A written record of the pre-entry safety meeting must be retained, training undertaken, and any subsequent safety meeting or efforts must be continued to determine if conditions are safe for work.

- An entry supervisor, thoroughly familiar with hazards, fire and accident prevention requirements, as well as first aid and rescue measures, must direct all work, including preparatory and repair work.

- Employees unfamiliar with confined space work must be thoroughly trained in the use of respiratory protective equipment and other safety and rescue equipment pertaining to the job prior to entry into a confined space.

- All confined spaces that could be inadvertently entered (i.e., some dikes, excavations, pits, submerged well heads) must have a sign(s) posted identifying it as a confined space and nofing that a Confined Space Entry Permit is required before entry.

- A permit-required confined space can only be entered after:
  - The tank, vessel, silo, hopper, line, pit, or other enclosed space is isolated, voided of hazardous materials and properly ventilated.
  - A Safe/Hot/Tank Entry Permit and all other applicable permits have been issued.

- Throughout the job, testing must be made to verify that conditions have not changed or are not changing from those expected when work began.

4.0 HAZARDS

Hazards may be present from the previous contents of a confined space, in clean tanks, or introduced as part of the work-taking place in a confined space. The plant or surroundings may pose additional hazards.

4.1 General Hazards

- Previous Contents – Before working in a confined space determine:
  - What the tank or vessel previously contained. *Note:* Use MSDS, 29 CFR 1910, Subpart Z and the current ACGIH TLVs for information on materials that could generate a potential hazard.
  - If any gases or solids could be introduced while employees are in a confined space.
  - If adjacent operations or confined spaces could pose a hazard.

- Clean Tanks – In clean tanks that have been closed for extended periods of time, oxidation (rusting) or other chemical reactions may absorb or replace oxygen to produce an asphyxiation hazard where none existed before.

- Toxic Substance – Inside tanks and vessels, the gradual release of toxic substance from sludge, scale, or slow chemical reactions may develop or add to gas or vapor concentrations and pose a hazard.

- Noise – Noise from venting or steaming vessels or from grinding inside tanks may pose physical hazards.

- Electrical – Electrical tools may present shuck hazards.

- Engines or Equipment – Engines or power equipment may pose a hazard by introducing combustion products or toxic exhaust fumes into the confined space.

- Static Electricity – Static electricity buildup may occur while flushing tanks or vessels with steam.

- Iron Sulfide Deposits – In oil and gas operations, self-igniting pyrophoric iron (iron sulfide deposits) may require keeping interior vessel walls wet.

- Vapors – Previous work crews may leave behind a hazard such as vapors from an epoxy coating as the tank dries.

4.2 Plant or Surroundings Hazards

Hazards that may occur from the plant or surroundings include:

- Any normal work hazards, such as slipping/tripping, bums, back strain from lifting, falling objects, and operating tools or rotating equipment.

- Employees in the confined space becoming isolated from rescue personnel.

- Over pressuring other process equipment during blanking/blinding off.

- Spills and other environmental problems caused by:
  - Mishandling/handling contaminated liquids from tank steaming operations.
  - Improper disposal of tank bottoms and sludge
  - Disposal of caustics, acids, or other chemicals.

- Air pollufion problems caused by:
  - Venting hydrocarbon or chemicals into the atmosphere.

5.0 ELEMENTS OF SAFE PERMIT-CONFINED SPACE ENTRY

5.1 Identifying, Classifying, and Evaluating Confined Spaces

- PTSI has evaluated the facilities for potential confined spaces.

- PTSI employees will be informed of the existence, locations, and hazards of confined spaces by posting of warning signage, or by site-specific training. In general warning signage will be posted only where access to a confined space does not require tools or keys for entry. Where deemed necessary, a sign reading "DANGER-PERMIT REQUIRED CONFINED SPACE-DO NOT ENTER" or similar language will be used.

5.2 Confined Space Exceptions

Entry into a confined space WITHOUT attendants, rescue, and emergency services is allowed provided that:

Prior to Entry (all below are followed)

- The only hazard posed is an actual or potential hazardous atmosphere.
- Facility management can demonstrate that continuous forced air ventilation alone is sufficient to maintain the confined space safe for entry.
- Management develops monitoring and inspection data that supports the above two points.
- Confined space monitoring and inspection data collection complies with all requirements of the confined space program.
- The inspection data collected is made available to each entrant.
- A permit is completed and maintained at the work-site to record data before and during confined space entry, and the data is made available to each entrant.
- The internal atmosphere of the confined space is tested with a calibrated direct reading instrnment for:
  - Oxygen content
  - Flammable gases and vapors
  - Potential toxic air contaminants

During Entry (all below are followed)

- If removing an entrance cover or door results in a condition that makes the confined space unsafe, that condition is eliminated before the cover or door is removed. *Note:* Double check that the vessel is empty and no hazards will result from removing the cover or door.

- When the entrance cover or door is removed, the opening is immediately guarded to prevent an accidental fall through the opening, or from outside objects falling on entrants in the confined space.

- No hazardous atmosphere is present when employees are in the confined space.

- Continuous forced air ventilation is used and:
  - Entry is NOT allowed until any hazardous atmosphere is eliminated.
  - The forced air is directed toward the work area inside the confined space.
    Important: The air supply for forced ventilation must be clean and not increase the hazards of the confined space.

- The atmosphere within the confined space is periodically tested to ensure that the forced air ventilation is preventing accumulation of a hazardous atmosphere.

- If a hazardous atmosphere is detected:
  - Entrants immediately leave the confined space.
  - The confined space is evaluated to determine how the hazardous atmosphere developed.
  - Before further entry into the confined space, corrective actions are implemented to prevent a re-occurrence, or the confined space is re-classified.

Re-classifying a Confined Space

A confined space can be re-classified as NOT a confined space provided that:

- The confined space has no actual or potential atmospheric hazards.

- All hazards within the confined space are eliminated without entry into to confined space.

- Atmosphere hazards remain eliminated.

- When entry is required to eliminate hazards, the entrant follows all requirements of the confined space until the hazards are and remain eliminated.

- Important: Forced air ventilation does **NOT** constitute elimination of the hazards.

- A permit is completed and maintained at the work-site to record data before and during confined space entry, and the data is made available to each entrant.

5.3 Equipment Requirements

When confined space entry is taking place, each PTSI facility must provide the following equipment to facilitate safe entry:

- Approved testing and monitoring equipment
- Ventilation equipment.
- Communication equipment necessary for the attendant and entrant to communicate.
- Personal protective equipment (when engineering and work practice control are **NOT** adequate protection).
- Barriers and shields to prevent or block pedestrian/vehicle entry into a confined space area.
- Ladders and other equipment needed for safe ingress and egress from a confmed space.
- Rescue and other emergency equipment necessary for emergency services and to rescue employees.
- Any other equipment necessary for safe entry into and rescue from a confmed space.

5.4 Entry Permit Requirements

PTSI's entry permit requirements include:

- The PTSI Safe/Hot/Tank Entry Work Permit must be completed prior to entering a confined space.

- The entry supervisor must sign and issue the entry permit. Before a Confined Space Entry Permit is signed, the entry supervisor must verify that all precautions and other measures called for on the permit are in effect.

- The Confined Space Entry permit must be posted at the entrance to the confined space *for its entire assignment period.* A copy of the permit must be stored in the permit book and retained for a period of one year.

- Permits are only issued for a period of one shift. Each shift fills out its own permit following all relevant steps and procedures. For succeeding shifts, or when the work area is left unattended for more than **30 minutes**, a responsible individual(s) is required to once again check all conditions of the permit, re-test the area, and sign the permit.

- If a work area is left unattended for less than **30** minutes, re-testing may be required, depending on the nature, location, and surrounding conditions of the confined space. In *some situations, re-testing is required after an unattended period of any length.*

- When conditions change, the old permit(s) must be revoked and a new permit(s) issued.

- A copy of the permit and any drawings or sketches showing blanks/blinds must be posted at the work-site.

5.5 Training Requirements

PTSI's training requirements include:

- Training for each entry supervisor, attendant, entrant, and emergency response person in compliance with OHSA Standards for Confined Spaces, 29 CFR 1910.146.

- All employees who work in and around confined spaces must acquire the understanding, knowledge, and skills necessary to safely perform the confined space job duties assigned to them.

- Each employee must be provided training:
  - Before being assigned duties for confined space entry.
  - When there is a change in assigned duties.
  - When there is a change in confined space operations that presents or identifies a new hazard.
  - When there are deviations in procedures or inadequacies in an employee's knowledge.

- The key goal of employee training is *proficiency* of assigned confined space job duties.

- PTSI must certify and maintain all confined space entry employee training records.

5.6 Duties of Entrants

PTSI requires that each *entrant:*

- Know the hazards that may be encountered during confined space entry, including signs, symptoms, mode changes, and consequences of exposure.

- Confirm confined space preparation.

- Inspect safety equipment and know how to use it.

- Follow safe work practices established for entry into ALL confined spaces.

- Communicate with the attendant to monitor entrant's status and to enable the attendant to alert the entrant to evacuate the confined space when necessary.

- Alert the attendant when recognizing any warning sign, symptom, or exposure to a dangerous situation, or when a prohibited condition is detected.

- Evacuate the confined space when:
  - An order to evacuate is given.
  - Atmospheric conditions of the permit are violated.
  - Behavioral changes are detected.
  - A prohibited condition is detected.
  - An evacuation alarm is activated.

- Be familiar with the MSDS for a product(s) that may be found in the confined space.

5.7 Duties of Attendants

PTSI requires that each *attendant*:

- Know the hazards that may be encountered during confined space entry, including signs, symptoms, mode changes, and consequences of exposure.

- Be aware of the possible behavioral effects of exposure on entrants.

- Continually maintain an accurate count of entrants inside the confined space.

- Remain *outside* the confined space during entry operations until relieved by another qualified and authorized attendant.

- Communicate with entrants to monitor entrant status and to alert entrants to evacuate the confined space when necessary.

- Monitor activities inside and outside the confined space to determine if entry remains safe for entrants, and to order an immediate evacuation of the confined space when:
  - Atmospheric conditions of the permit are violated.
  - Behavioral changes are detected.

- An outside situation that could endanger the entrants is detected.
- The duties assigned to the attendant cannot be fulfilled.

- Be familiar with the MSDS for a product(s) that may be found in the confined space.

5.8 Duties of Entry Supervisors

PTSI requires that *entry supervisors:*

- Know the hazards that may be encountered during confined space entry.

- Before signing the entry permit and allowing entry to begin, verify that:
  - The entry permit is properly completed.
  - All necessary tests have been completed.
  - All procedures and equipment specified by the permit are in place.

- Remove unauthorized individuals who enter or who attempt to enter the confined space during entry operations.

- Use only equipment approved by a certifying body (e.g., NIOSH, CSA).

- Ensure that all persomel entering a confined space are properly trained for the function they are to perform.

- Be familiar with the MSDS for a product(s) that may be found in the confined space.

In addition, entry supervisors must ensure:

- All equipment is checked and is in safe working condition before beginning work.

- An effective means of communication is available within the confined space.

- A means of rescue is provided.

5.9 Rescuer Requirements

PTSI's primary means of rescue is to utilize the local fire department. Rescuer requirements include:

- Determining who is the rescuer.
- Defining the type and availability of special equipment the rescuer may need.
- Deciding how to summon additional rescuers.
- Performing rescue training and drills.
- Maintaining and checking rescue equipment.
- Being adequately trained and certified in confined space entry.

Important: In a hazardous atmosphere, the minimum requirements for the person effecting an emergency rescue in a confined space are: **SCBA or full facepiece airline with egress bottle, another attendant, and a lifeline and harness.**

5.10 Isolation Methods

One of the following methods must be used to isolate a confined space from all liquid and vapor lines, and other process equipment.

Important: All nitrogen, inert and lethal gas lines MUST be isolated VIA disconnecting (Method #1).

Method	Step
#1 Disconnect	1. Close, lockout/tagout, and place DANGER tags on upstream valves. 2. Cap or plug open flanges. 3. Disconnect and remove a portion of the line.
#2 **Blank/Blind**	1. Spectacle blank or blind off (blinds must be rated to withstand the pressure) as close to the tank

	or vessel as possible. 2. Lock and tag all valves in the safe position. 3. Place DANGER tags on all valves.
#3 Double Block and Bleed	1. If disconnecting or blanking can't be done due to system design, double block and open bleed valve between the closed block valves. 2. All valves must be locked in the safe position. 3. Place DANGER tags on all valves *Note:* Some jurisdictions, such as British Columbia, do **NOT** allow single or double valve lockout at any time.

When isolating a confined space:

- Show the location of blanks or blinds in a diagram or checklist on the Confined Space Entry Permit, and flag them at the work-site for visibility. The actual blanks or blinds should be the same metal specification as the system, or better.

- If *threaded* pipes are used, threaded plugs or caps should be of the same material as the existing pipe.

- **UNDER NO CIRCUMSTANCES RELY ON SINGLE VALVE CLOSURE FOR ISOLATION WHEN EMPLOYEES MUST ENTER A TANK OR VESSEL.**

- Install *blanks, blinds, or plugs* as close to the confined space as possible to prevent formation of pockets of contaminants from entering the confined space.

- Place DANGER tags on blanks or blinds before entering a tank or vessel, especially at a work-site with on-site contractors.

- When using *double block and bleed,* lock the bleed valve in the open position and pipe to a place of safe disposal in the event the product valve fails.

5.11 Lockout/Tagout Requirements

All lockout/tagout requirements must be followed as described in PTSI's SOP-06, Lockout/Tagout Standard.

5.12 Ventilation Requirements

PTSI's ventilation requirements include:

- Prior to entry into a confined space, a normal air change, equivalent to *three times the volume of the enclosure*, is recommended.
- After entry, 6 to 12 *air changes per hour* are suggested, if practical for the size of the tank or vessel.
- Ambient air must be blown into the confined space to provide air movement to the location of employees, and/or to exhaust or dilute contaminants.
- Additional mechanical air movers or blowers should be used to ensure sufficient fresh air passes through the enclosure.
- All clean out doors must be opened and the tank or vessel thoroughly ventilated, preferably by a positive method of mechanical ventilation that removes contaminants from all pockets or comers and voids re-circulating contaminated air.
- Once a tank or vessel is cleaned and ventilated, the mechanical exhaust ventilation equipment must be kept operating to:
  - Provide secondary protection and prevent the accumulation of flammable vapors above 10% of the LEL, or toxic materials greater than 25% of the TLV; and to maintain oxygen concentrations between 19.5% and 23.5% by volume in air.

- Remove contamination produced by work inside the tank vessel, such as welding, cutting, or painting.
- Cool the tank or vessel to improve working conditions.

- Since heat can build up during welding or cutting operations in confined spaces, *general exhaust ventilation* at a rate of 60 cubic meters (@2000 cubic feet) of air per minutes per welding unit helps control heat and fumes from mild steel welding.

- *Note:* Fumes from stainless or galvanized welding should be exhausted by *local exhaust ventilation*.

- When torch cutting over extended periods of time, extra air or supplied air-cooling may be necessary to maintain desirable temperatures.

- Forced air ventilation must be continuous throughout the entire work period.

5.13 Testing Requirements

Prior to initial entry, the confined space must be tested for (in the following sequence):

- Oxygen levels

- Flammable gas or vapors

- Any suspected toxic contaminants

PTSI's testing requirements include:

- An authorized person, trained in the use of the test equipment and familiar with the hazards, should conduct the testing throughout the entire confined space.

- Testing instruments must be:
  - NIOSH, CSA, Factory Mutual Systems, MSHA, or Underwriters Laboratories approved.
  - Used within the calibrafion period specified.

- SCBA – IDLH situations require either SCBA or a supplied air respirator with full facepiece and a five-minute egress bottle.

- APR – Canister masks, cartridge filter type masks, or disposable filter masks must be worn when concentrations of other contaminants (i.e., solvents or paint vapors, pesticides or organic gases or mists) are above 25% of the TLV but below and IDLH condition. The APR must fit the individual properly (qualitative Fitness Test), and the respirator's protection factor must not be exceeded.

6.2 Factors to Consider

When deciding who can wear personal protective equipment, consider the following:

- The individuals age, amount of exertion, and respiration rate.

- The individual's ability to overcome the increased resistance to wearing a respirator (inspiration and expiration) at the required work levels.

- The individual's ability to function under the physical load of the respirator combined with any medical conditions he/she may have, such as cardiovascular, respiratory disorders or hearing impairments.

- Skin irritation, claustrophobia, or other physical discomforts resulting from the selected equipment.

- The visual restrictions caused by a facemask. **Wearing of** contact lenses with a respirator is **NOT** allowed. Spectacle-type glasses, with altered or removed temples, can be worn under special face-pieces equipped for that purpose.

- Anyone required to wear a respirator should be medically certified by a physician as fit to wear one.

6.3 Additional Safe Work Practices

PTSI's safe work practices include:

- Extension lights should be **12** volt. *Note:* A (G.F.C.I) ground fault circuit interrmpter protection must be installed when greater than 12-volt electrical tools are used in a confined space.

- Compressed gas cylinders, other than breathing air, must NOT be taken into a confined space.

- For certain operations, such as painting or welding and cutting, additional ventilation may be needed.

- Anything brought into a confined space, which may introduce an additional hazard, must be examined. Hoses and nozzles of welding or cutting equipment must be carefully inspected for gas leaks and condition prior to using them in a confined space. Hose showing leaks, burns, worn places, or other defects rendering it unfit for service shall be repaired or replaced.

- Fire-watchers shall be required whenever welding or cutting is performed in locations where other than a rninor fire might develop.

- When arc welding is to be suspended for any substantial period of time, such as during lunch or overnight, all electrodes shall be removed from the holders and the holders carefully located so that accidental contact cannot occur and the machine be discomected from the power source.

- Torch valve: In order to eliminate the possibility of gas escaping through leaks or improperly closed valves, when gas welding or cutting, the torch valves shall be closed and the gas supply to the torch positively shut off some point outside the confined area whenever the torch is not to be used for a substantial period of time, such as during lunch hour or overnight.

- Any equipment (such as water hose nozzle) capable of generating a static discharge must be grounded with at least **#8** gauge or larger wire (use spring-type battery clamps, magnetic connectors, or special clamps).

- On longer jobs, ground circuit continuity must be periodically verified with an ohm meter or a static voltmeter.

- Pneumatic tools must be operated with compressed air, NEVER with inert gas.

- When a job is completed, the job supervisor must thoroughly check to ensure:
  - No tools, equipment, or personnel are left behind.
  - All blinds are removed as shown in the diagram on the permit.
  - The vessel is properly closed and sealed.
  - Valves are retumed to the correct positions.

1.0 SCOPE

This standard operating procedure addresses the environmental, health and safety (EHS) requirements for Contractors and service vendors performing work at facilities operated by Pacific Terminal Services.

1.1 References

This Standard references, ***but is not limited to:***

- FAMM Standard Facility Pracfice No. SFP-33

1.2 Definitions

- Contractor – refers to any person(s) or company that is working at a PTSI facility, under a PTSI contract or purchase order. This shall typically include Contractors which are working on a specific job or service vendors that are working under an on-going contract. For purposes of this SOP, the term shall not necessarily include service vendors which do not enter the active processing areas of the facility (e.g., janitorial, food and drink, or delivery services).

2.0 RESPONSIBILITIES

It is the responsibility of the General Manager to ensure that the facility complies with the minimum standards defined by the SOP and all applicable national, state and local regulations.

It shall be the responsibility of the Terminal Manager or project engineer to ensure that Contractors working on projects for which they are responsible:

- Are qualified to work at the facility,
- Receive appropriate instruction on Contractor requirements,
- Participates in a pre-job safety conference and routine safety meetings as appropriate, and

- Meet all applicable standards as may be determined through Contractor audits/inspections.

3.0 GENERAL REQUIREMENTS

The following minimum general standards for the Contractor EHS program shall apply to all facilities:

- The Contractor is ultimately responsible for the safety and health of his/her employees and for compliance with applicable environmental, health and safety laws and regulations. Each contract that is established between PTSI and a Contractor shall explicitly establish this responsibility.

- Facility management shall provide a written Contractor EHS standards booklet to each Contractor working at the facility. The Contractor EHS standards booklet shall communicate the following major topics:

  - Specific health and safety standards that the Contractor must adhere to while working within the facility;
  - Specific environmental standards that the Contractor must adhere to while working within the facility;
  - Emergency response requirements including internal emergency communication, alarm signals, evacuation routes, internal spill notification requirements, and the off-site emergency response organizations (such as fire departments, hospitals, or spill response Contractors);
  - Area specific hazards (e.g. areas where H_2S might be encountered) including areas which are "off-limits" to Contractors;
  - Areas which require specific personal protective equipment (PPE);
  - Site security requirements for entry into the facility, use of parking areas, sign-in/sign-out protocols, camera restrictions, and other requirements; and
  - Substance abuse policies.

- Prior to the start of each job, Contractors shall have a pre-job safety conference to:

  - Identify hazards specific to the job;

- Identify site hazards and precautionary measures;
- Identify emergency response procedures;
- Clarify the Contractor's EHS responsibilities;
- Review the Contractor training requirements;
- Identify recordkeeping requirements;
- Review PPE requirements; and
- To present and discuss the Contractor EHS standards booklet.

- Contractors working on site shall coordinate emergency response preparedness with the facility's emergency response organization. New hazards or potential emergencies which are unique to the Contractor's operations on site shall be considered and incorporated into the facility emergency planning and response preparedness prior to the Contractor beginning work on site.

- Contractors are responsible for complying with the hazard communication requirements for his/her own employees, including any required training. Any hazardous materials brought on site by the contractor shall be properly labeled, packaged, and stored. Contractors shall be responsible and contractually obligated for providing Material Safety Data Sheets (MSDSs) for any hazardous chemicals which they bring onto facility property.

- Contractors shall be obligated to maintain good housekeeping in all areas where they are performing work.

- Contractors shall follow PTSI standards (or their own if demonstrated to be equivalent) for all activities which require a permit or checklist. Such activities include but are not limited to the subjects addressed by the following facility standard operating procedures (SOPs):

  - Electrical Safety;
  - Ignition Source Control;
  - Lockout/Tagout; and
  - Confined Space Entry

- Contractors shall ensure that their employees are equipped with and properly use appropriate PPE for every task or job within the facility. It

is the responsibility of the Contractor to perform PPE assessment and to provide the PPE to his/her employees.

- Unless otherwise stated in the contract, the Contractor shall be responsible for all environmental permits (e.g., air permits) which may be required for the Contractor's equipment or activities while on site.

- Unless other arrangements are made with facility management, all wastes generated by the Contractor on site are the responsibility of the Contractor, including compliance with applicable solid and hazardous waste management regulations.

- With the exception of the pre-job safety conference, the Contractor is responsible to ensure that each of his/her employees has all of the training as required by law to perform the type of work being done. The Contractor is also responsible to ensure that documentation of the training is in place.

- In addition to the above-listed requirements, each Contractor must either follow the following PTSI SOPs, or an equivalent standard of their own, as applicable to their contracted work assignments:

    - Asbestos, Inorganic Lead and Man-Made Vitreous Fiber;
    - Hearing Conservation;
    - Hydrogen Sultide;
    - Life Safety (Egress);
    - Powered Industrial Vehicles;
    - Respiratory Protection;
    - Scaffolding;
    - Vehicle Safety;
    - Ventilation;
    - Fall Protection.

- The facility shall maintain records to demonstrate compliance with this SOP. Such records shall include pre-job safety conference records, contracts, inspection forms, and other supporting documents.

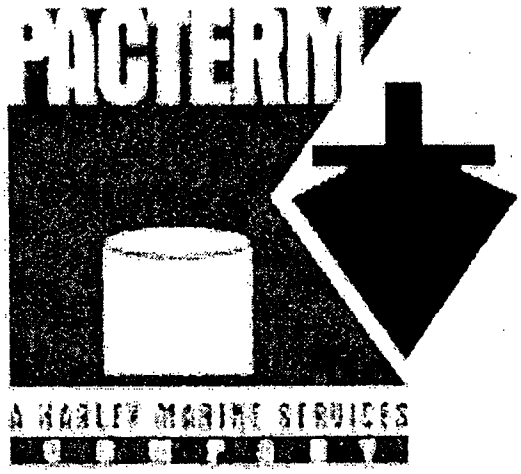
4.0 PERFORMANCE MONITORING

Facility Managers are responsible for performing or directing periodic self evaluations or facility inspections to ensure that the Contractor EHS program is being properly and effectively implemented. At a minimum each facility shall:

- Review contracts to ensure Contractor EHS requirements are explicitly stated;
- Perform periodic checks/audits of Contractors on site to ensure that the Contractor's employees are following all required EHS standards and regulations;
- Conduct a period check of Contractor training and the associated training records; and
- Take effective corrective and preventative action where deficiencies are observed.

5.0 EXCEPTIONS

Exceptions to the requirements of this SOP may be requested, negotiated and authorized as specific conditions of the governing contract.



CONTRACTOR EHS STANDARDS BOOKLET

PORTLAND

Revised 03/02

1.0 SCOPE

This Contractor safety booklet addresses the environmental, health and safety (EHS) requirements for Contractors and service vendors performing work at facilities operated by Pacific Terminal Services.

1.1 Definitions

- Contractor – refers to any person(s) or company that is working at a PTSI facility, under a PTSI contract or purchase order. This shall typically include Contractors which are working on a specific job or service vendors that are working under an on-going contract. For purposes of this SOP, the term shall not necessarily include service vendors which do not enter the active processing areas of the facility (e.g., janitorial, food and drink, or delivery services).

2.0 GENERAL REQUIREMENTS

The following minimum general standards for the Contractor EHS program shall apply to all facilities:

- The Contractor is ultimately responsible for the safety and health of his/her employees and for compliance with applicable environmental, health and safety laws and regulations. Each contract that is established between PTSI and a Contractor shall explicitly establish this responsibility.

- Prior to the start of each job, Contractors shall have a pre-job safety conference to:

  - Identify hazards specific to the job;
  - Identify site hazards and precautionary measures;
  - Identify emergency response procedures;
  - Clarify the Contractor's EHS responsibilifies;
  - Review the Contractor training requirements;
  - Identify recordkeeping requirements;
  - Review PPE requirements; and
  - To present and discuss the Contractor EHS standards booklet.

- Contractors working on site shall coordinate emergency response preparedness with the facility's emergency response organization. New hazards or potential emergencies which are unique to the Contractor's operations on site shall be considered and incorporated into the facility emergency planning and response preparedness prior to the Contractor beginning work on site.

- Contractors are responsible for complying with the hazard communication requirements for his/her own employees, including any required training. Any hazardous materials brought on site by the contractor shall be properly labeled, packaged, and stored. Contractors shall be responsible and contractually obligated for providing Material Safety Data Sheets (MSDSs) for any hazardous chemicals which they bring onto facility property.

- Contractors shall be obligated to maintain good housekeeping in all areas where they are performing work.

- Contractors shall follow PTSI standards (or their own if demonstrated to be equivalent) for all activities which require a permit or checklist. Such activities include but are not limited to the subjects addressed by the following facility standard operating procedures (SOPs):

    - Electrical Safety;
    - Ignition Source Control;
    - Lockout/Tagout; and
    - Confined Space Entry

- Contractors shall ensure that their employees are equipped with and properly use appropriate PPE for every task or job within the facility. It is the responsibility of the Contractor to perform PPE assessment and to provide the PPE to his/her employees.

- Unless otherwise stated in the contract, the Contractor shall be responsible for all environmental permits (e.g., air permits) which may be required for the Contractor's equipment or activities while on site.

- Unless other arrangements are made with facility management, all wastes generated by the Contractor on site are the responsibility of the Contractor, including compliance with applicable solid and hazardous waste management regulations.

- With the exception of the pre-job safety conference, the Contractor is responsible to ensure that each of his/her employees has all of the training as required by law to perform the type of work being done. The Contractor is also responsible to ensure that documentation of the training is in place.

- In addition to the above-listed requirements, each Contractor must either follow the following PTSI SOPs, or an equivalent standard of their own, as applicable to their contracted work assignments:

  - Asbestos, Inorganic Lead and Man-Made Vitreous Fiber;
  - Hearing Conservation;
  - Hydrogen Sulfide;
  - Life Safety (Egress);
  - Powered Industrial Vehicles;
  - Respiratory Protection;
  - Scaffolding;
  - Vehicle Safety;
  - Ventilation;
  - Fall Protection.

- At the conclusion of the pre-job safety conference, the Contractor shall sign a form certifying that a Contractor Safety booklet has been received and a pre-job safety conference has been completed.

3.0 HEALTH AND SAFETY STANDARDS

- PTSI recommends the use of protective eyewear at all times within the facility.
- PTSI recommends the use of steel-toed boots at all times within the facility.
- Drug or alcohol use is strictly prohibited by PTSI.

- Eyewash stations are located at the rail spur, the boiler room, the warehouse, the lab and the dockshack.
- First aid kits are located in the boiler room, the warehouse, the office and the dockshack.

4.0 WATER SYSTEM

- Both tank farms have a central sump from which storm water is pumped to an oil/water separator. From there the water is pumped to ponds on NNG's property.
- Care must be taken to prevent oil, dirt, metal parts or any other foreign matter from entering sumps or the storm water system.
- When working near a sump, the sump should be covered to prevent hazardous materials from entering the storm water system.
- The sump pump located within the affected tank farm should be switched off during work hours to prevent contaminated waters from being pumped into the ponds.

5.0 EMERGENCY RESPONSE REQUIREMENTS

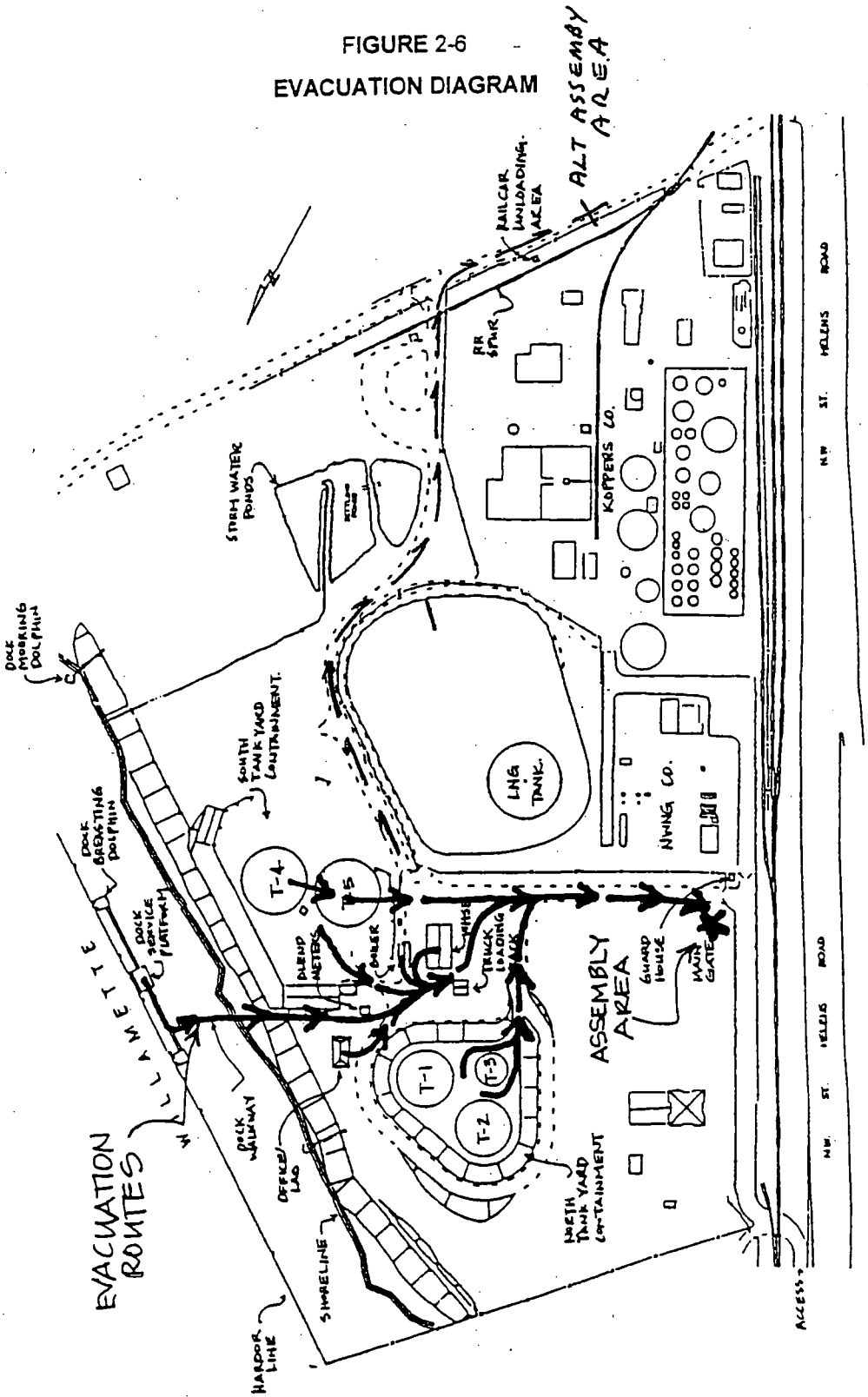
- In the event of an emergency at the facility, Contractors shall notify facility personnel immediately.
- All Contractor personnel shall move off-site in accordance with the evacuation routes given in this Contractor safety booklet.
- Contractor employees shall not retum to work until they receive approval by facility personnel. New permits must be issued before work can resume.

6.0 SITE SECURITY REQUIREMENTS

- All Contractor personnel shall sign-in in with facility personnel in the boiler room office at the start and end of the workday.
- Parking shall be provided in the area southwest of the warehouse or along the fence north of the tmck racks.

FIGURE 2-6

EVACUATION DIAGRAM



PRE-JOB SAFETY CONFERENCE CHECKLIST

- ❑ CONTRACTOR HAS RECEIVED CONTRACTOR SAFETY BOOKLET
- ❑ EMERGENCY EXITS HAVE BEEN IDENTIFIED
- ❑ EMERGENCY RESPONSE PROCEDURES HAVE BEEN EXPLAINED
- ❑ FACILITY WALKTHROUGH HAS BEEN COMPLETED
- ❑ STORM WATER DRAINS HAVE BEEN IDENTIFIED AND COVERED
- ❑ SUMP PUMP IN AREA OF WORK HAS BEEN TURNED OFF
- ❑ HAZARDOUS AREAS OR RESTRICTED AREAS HAVE BEEN IDENTIFIED
- ❑ PRIMARY CONTACT PERSON HAS BEEN ASSIGNED
- ❑ PPE REQUIREMENTS HAVE BEEN IDENTIFIED
- ❑ CONTRACTOR HAS BEEN NOTIFIED THAT FACILITY IS INHERENTLY DANGEROUS AND THAT THE CONTRACTOR ENTERS AT HIS OWN RISK
- ❑ ALL NECESSARY PERMITS HAVE BEEN COMPLETED

Authorized Representative of PTSI Date

Contractor Date

PACIFIC TERMINAL SERVICES, INC. SAFE / HOT / TANK ENTRY WORK PERMIT

FACILITY LOCATION:		PERMIT NUMBER:	DATE:
ISSUED TO:		PERMIT STARTS: ____AM ____PM	PERMIT ENDS: ____AM ____PM
WORK AREA:			NUMBER IN GROUP:
SPECIFIC EQUIPMENT & TOOLS USED:			
WORK TO BE DONE:			

**********WHERE CHOICES ARE GIVEN, INDICATE ALL THAT APPLY**********

PERSONAL PROTECTIVE EQUIPMENT

	Hard Hat / Bump Cap / Electrical Resistant		Protective Clothing (Coveralls / Apron)
	Safety Glasses with Side Shields		Fire / Chemical / Dust Resistant
	Goggles		Safety Shoes / Boots: Chemical Resistant / NonConductive
	Gloves: Nitrile / Leather / Cloth / Other		Breathing Apparatus (Resirator)
	Hearing Protection		Lifeline /Harness / Belt
	Face Shield (Use Eye Protection Also)		NO: Loose Clothing / Belts; Unrestrained / Long Hair / Neckwear

HAZARD COMMUNICATION INFORMATION

	Facility Contractor Guidelines Reviewed		MSDS Located at:
	Haz Com Training Complete for All Contractor Personnel		MSDS Given to Contractor

REQUIREMENTS

	Wind Direction / Velocity Monitored		Overhead Power Lines
	Drains Covered / Plugged		Barricade Area
	Used Bonded Metal Containers for Draining Flammables		Turn off Rectifiers (Cathodic Protection)
	Check Drains / Area / Equipment with Explosimeter:		Check for Toxics: e.g. Lead / Benzene / Hydrogen Sulfides, etc.
	Meter Operating Correctly		
	Other Work Nearby / Overhead		GFCI (Required if Using Extension Cords)
	Pipe Line / Tank Movement Stopped		Check Health & Safety on Back

LOCKOUT / TAGOUT (PROCESS / ELECTRICAL / HYDRAULIC / ETC. ENERGIES)

This permit	Completed Before This Permit		This permit	Completed Before This Permit
	Product / Pressure in Pipes			Electrical Energy: Approx. Voltage: AC/DC
	Valves Closed / Locked / Tagged			De-Energized / Locked / Tagged
	Line Disconnected / Blinded			If Working on Circuits, Test w/ Meter
	System Depressured & Drained			Hydraulic / Pneumatic / Gravity /Steam / Other
	Bleeder Valve Open / Locked / Tagged			Approx. Magnitude:
	Pump De-Energized / Locked / Tagged			Blocked / Locked or Secured

TRENCHING / DIGGING

	Competent Person		Sloping
	Utilities Contacted if Required		Means of Egress from Excavation
	Shoring		Excavated Materials Stored 2+ feet from Edge

HOT WORK (WELDING / GRINDING / CHIPPING / ETC.)

	Fire Extinguishers : Location:		Pressurized Fire Hose
	WELDING		Intrinsically Safe Equipment
	Remove Combustibles from Area		Explosion - Proof Equipment
	Check Welding Leads / Cables / Hoses		Check Area for Leaks
	Welding Machine Bonded to Work		Check Area for Sources of Ignition
	Check Area for Flammables:		Fire Watch (Instructions on Back)
	LEL Reading: By:		Hot Tapping (Get Help from Engineer)
	Welding Hood / Goggles		Contain Sparks
	No Gas Cylinders Inside Vessel		Other:

TANK / CONFINED SPACE ENTRY

	Isolation: See Lockout / Tagout Above		OSHA Permit - Required Confined Space Entry:
	Ventilation: Type		Entry Supervisor:
	Normal Confined Space Entry:		Attendant:
	Hole Watch		Oxygen / LEL Level (Log Required)
	Oxygen Leven 19.5% or More: Reading		List of Entrants: Inside
	LEL: 0% Less than 10%		Breathing Apparatus
	LEL Reading: By:		Communication
	Meter Operating Properly: Initials:		Accidental Entry Prevented
	Low-Voltage Electrical Equioment		Rescue Equipment

PTSI WORK PERMIT CHECKLIST

PTSI personnel and contractors shall comply with the most stringent regulations, standards, or guidelines available. Resources commonly used include the National Fire Protection Association (NFPA) 51B and 241; Occupational Safety and Health Administration (OSHA) 29 CFR 1926.352 & 29 CFR 1926. 150; American National Safety Institute (ANSI) ANSI/UL 521 & ANSI Z49.1; 4-10.

Work Permit – A project walk through with the worker or contractor is required prior to issuing a Work Permit. The individual(s) performing the work are ultimately responsible for ensuring compliance with the requirements of this permit. The attached Work Permit will be completed prior to any work requiring increased safety measures or awareness, including but not limited to: confined spaces, trenching or digging, or work that produces sparks, flames, or has the potential to cause a fire. The Work Permit is valid for the specified task noted on the Work Permit. Any variance from the original scope of the work will require issuance of a new Work Permit.

Inspections – The worker/permit holder shall inspect the work area a minimum of once per day to ensure compliance with permit requirements. Operators have the authority to stop work if safe work practices are not being utilized or the scope of work defined in the Permits is being exceeded. The Terminal Superintendent shall be immediately notified of any deficiencies.

Atmospheric Testing – Prior to hot work or confined space entry, appropriate gas testing must be conducted by a qualified person. Combustible gas readings shall be 10% of the lower explosive limit (LEL) or lower for issuing Safe Work Permits. A **HOT WORK PERMIT SHALL NOT BE ISSUED IF THE PERCENT OF LEL IS MORE THAN 0.0%.** Gas testing should be completed as near as possible to the actual start of work, ***definitely within two hours of starting.*** The time that the gas test was taken shall be shown on the permit, and at no time will it be later than the time stated for which work, may begin.

Fire Detection – Fire detection equipment shall be protected from false activation and damage. Work shall not proceed until confirmation of fire alarm deactivation is verified with PTSI. Impairments of fire detection systems shall be minimized.

Fire Suppression – Fire Suppression systems (e.g. fire sprinklers, dry chemical, foam deluge, etc.) shall be protected by noncombustible shielding or guarding to prevent inadvertent activation. The protective shielding shall be promptly removed upon completion of work. Fire suppression systems in the permit area shall be examined prior to the start of "hot work" to ensure that protective measures are implemented.

Rangeland Fires – Vegetation and other combustibles must be removed or cut back to prevent ignition.

Traffic Control – Barriers will be provided to assure traffic is prevented from exposure to work areas. Shields will be used to prevent exposure to sparks and flashes during hot work. A clear path of at least 44" must be maintained at all exists.

Cutting and Welding Controls – The location of hot work will be determined by utilizing the following priority list:

1.) An area designed for hot work use such as welding shops.
2.) If work must be conducted on site, combustibles shall not locate within thirty-five feet of the work area.
3.) If the work must be conducted on site and combustible cannot be removed from within thirty-five feet of the work area, fire barriers such as screens or blankets will be used to protect combustibles.

Housekeeping – Care shall be taken to assure the barriers will not allow sparks to penetrate the seams. Openings in walls, floors, or ducts will be protected from sparks. Acetylene and oxygen tanks will be protected from flame/sparks.

Hazardous Materials – The contractor shall have a written Chemical Hazard Communication Program. Information on this program and MSDS will be readily available for all hazardous materials including welding rods and welding materials. Adequate ventilation will be provided for all hot work processes or confined spaces.

Personal Protection – Personal protective equipment will be appropriate for the task. Eye protection will comply with ANSI Z87.1-1991. Long sleeved shirts, long pants with the pant leg outside of boots, leather gloves, and leather apron will be used for welding and cutting operations. Additional controls are required if bulky clothing or protective suits are used that reduce the worker's ability to recognize hazards or to react to an emergency situation.

Equipment Safety – All equipment will be stored in a central location that does not block exits. Acetylene and oxygen tanks will be stored and changed in compliance with OSHA and NFPA requirements. Anti-flashback devices will be used on acetylene and oxygen tanks.

Fire Protection – Equipment will be sufficient for the hazards present. At a minimum, a 2A: 20B:C rated fire extinguisher is required. The fire extinguisher shall be readily available in the immediate work area.

Fire Watch – A fire watch shall be established to ensure the safety of workers and the protection of assets. The hot

1.0 SCOPE

The Hot Work/Vehicle Entry Permit Standard establishes the minimum guidelines required to issue a Hot Work/Vehicle Permit as mandated by OSHA Standard 29 CFR I 91 0.252(a).

The purpose of this Standard is to:

- Ensure that safe work practices and procedures are followed prior to and during the execution of hot work operations in or near a PTSI facility.
- Avoid actions which would lead to, or cause catastrophic releases, fires, or explosions.
- Provide for the safety of all personnel, the environment, and property.

The procedures in this Standard:

- Apply to all PTSI personnel and anyone on PTSI premises, but may extend beyond PTSI premises to ensure their intent and purpose are met.
- Are for use at facilities such as process plants, terminals, pump stations, and storage facilities.

1.1 References

This Standard references, but ***is not limited to***:

- 49 CFR Part 192 and Part.195
- American Petroleum Institute (API) Publication 2015, Safe Entry and Cleaning of Petroleum Storage Tanks
- American Petroleum Institute (API) Publication 2201, Procedures for Welding or Hot Tapping on Equipment Containing Flammables
- PTSI SOP-12, Confmed Space Entry

- PTSI SOP-06, Lockout/Tagout
- National Fire Protection Association (NFPA), Standard 51B
- Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910, Subpart I, Personal Protective Equipment
- Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.1000, 1910.119(k), 1910.146(b), 1910.147
- Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.252(a)
- Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.272(f)

1.2 Definitions

- Blanking/blinding -- a procedure in the isolating process used to ensure no product or material enters the work area through the associated lines. Blanks can be used on the flanged end of open lines, and blinds inserted between flanged comections. Blanks and blinds must be of sufficient size and thickness to withstand maximum potential pressures.
- Designated Construction Representative --The contract or maintenance worker who will be performing the hot work, or a supervisor who has absolute control over the hot work operations and instructs the worker(s) on the requirements of the permit.
- Fire watchers -- Personnel who are trained in the use of the tire extinguishing equipment being used and are familiar with the facilities for sounding an alarm in the event of a tire.
- Hot tapping -- a procedure for attaching a new connection to piping or equipment that is already in service (i.e., under pressure).

- Ignition sources -- refers to, but is not limited to:

  - Open flames
  - Electric sparks and arcs
  - Hot surfaces
  - Pyrophoric reactions
  - Vehicle ignition systems and catalytic heaters
  - Electric tools and extension cords
  - Flashlights and flash cameras
  - Static electricity
  - Battery-operated equipment
  - Portable lights and generators
  - Cathodic protection
  - Sandblasting, hammering, grinding, chipping, and soldering

- Isolate -- the means by which all potentially hazardous energy releasing devices and equipment connected to the work object are prevented from affecting the designated work. The preferred isolation method is disconnecting and removing a portion of the line, with the associated valves tagged closed, and the open flanges capped. If system design prevents disconnection, double block the line and open bleed valves with all valves locked in the safe position.

- **LEL** (Lower Explosive Limit) (a.k.a. LFL - Lower Flammable Limit) -- lower flammable limit of a vapor or gas; the lowest concentration (lowest percentage of the substance in air) that will produce a flash of fire when an ignition source (heat, arc, or flame) is present. At concentrations lower than the **LEL**, the mixture is too "lean" to burn.

- Lockout/Tagout-- procedure in the isolating process that ensures all energy sources for electrical or rotating equipment and all isolating valves for gas, propane, cmde, flare gas, etc., are locked in the **off** or valve closed position. Prevents equipment from starting up or releasing any energy or product into a work area or confined space while employees are present. Placement of locks and chains on valves and switches (preferably more than one) by an operations or maintenance representative, or each employee in a confined space, so only the key holder(s) can open them. Placement of tags to inform and warn personnel

that the device or equipment cannot be operated until the related work is completed.

- **R**esponsible **O**perator --The process operator or person responsible for the area in which the hot work will occur.

- Vehicle entry -- travel or presence of motorized vehicles or equipment within a potentially hazardous process or work area.

2.0 GENERAL

A Hot Work/Vehicle Entry Permit is required whenever:

- Any potential ignition source is used or contemplated in locations and areas where flammable conditions could exist.

- Work involves the potential for creating hazardous, flammable conditions through reaction processes NOT including spark or flame-producing equipment.

- The passage or presence of any motorized vehicle or equipment is required in or near restricted plant areas, or other work areas where flammable conditions could exist.

3.0 RESPONSIBILITY

The following personnel have specific responsibilities during hot work/vehicle entry:

- Facility Management

- Authorized **PTSI R**epresentative(s)

Upon completion of the designated work, the **PTSI facility** must maintain a copy of each issued permit at the facility for a period of one year from the date of issuance.

3.1 Facility Management

Facility Management is responsible for:

- Implementing the policies and procedures in this Standard in order to ensure safe working conditions at the facility.
- Designating the Authorized PTSI Representative(s) in the permit proceedings.

Providing the Authorized PTSI Representative(s) with the necessary and proper training that allows him (them) to recognize potential hazards and know the safe work procedures.

3.2 Authorized PTSI Representative(s)

The Authorized PTSI Representative(s) is responsible for:

- Preparing and signing a valid permit for the designated work.
- Ensuring the safe execution of the Hot Work/Vehicle Entry Permit.
- Testing and inspecting the designated work-site before hot work or vehicle entry is undertaken.
- Designating the precautions that are to be followed during the course of operations.
- Issuing a written permit authorizing work to proceed.
- Ensuring the safety of personnel, equipment, and operations during execution of the designated work.
- Making determinations and authorizations pertaining to the safety conditions located at the site.

The Authorized PTSI Representative(s):

- Must be trained in and have a working knowledge of the Hot Work/Vehicle Entry Permit procedures (as outlined in this Standard).
- Must have competent knowledge of the compliance requirements of OSHA Standard 29 CFR 1910.252(a) and of NFPA Standard 51 B.
- Has the authority to alter, suspend, or terminate work activity which, in his opinion, could lead to a hazardous situation or accident.

Note: In order to protect the safety of the workers and the integrity of the project, only one Authorized Representative per 'site', per shift, should be authorized to manage the execution of Hot Work/Vehicle Entry work. This will also ensure the continuity of information flow between Authorized Representatives between shift changes.

4.0 PERMIT ISSUANCE POLICY

PTSI's policy is that if the work cannot be done safely, it will not be done.

During the initial inspection and testing phase of the permit issuance procedure, the Authorized PTSI Representative may determine that the object(s) to be worked on can be removed from the covered process area to a safe work-site, and permit issuance is not necessary. However, if upon inspection, removal is not feasible, the permit process must continue.

The Authorized PTSI Representative determines the:

- Permit issuance general requirements
- Conditions requiring a permit

4.1 General Requirements

- Before a Hot Work/Vehicle Entry Permit can be issued, a careful analysis and area inspection should be made to determine if the site is safe and ensure that no reasonable probability exists for any flammable or combustible material to enter the work-site during execution of the permit.

- Before beginning hot work, equipment to be worked on must be properly opened, isolated from other equipment containing flammable or toxic materials, and gas freed or purged to safely perform the intended work. Valves should NOT be relied upon for this purpose. Disconnection or blanking is a preferable procedure, as well as using the lockout/tagout system.

- The Authorized PTSI Representative, using an appropriate combustible-gas indicator, performs tests for possible flammable vapor concentrations before hot work or entry begins. The surrounding area and equipment should be thoroughly checked, even if the equipment has been steamed, flushed, purged, or otherwise cleaned.

- If tests reveal concentrations of flammable vapors of 10% LEL or more, under no circumstances should work be allowed to continue until appropriate safety precautions are taken to eliminate the concentrations from the designated area.

- Good housekeeping is important in preventing conditions that could lead to emergency situations and should be practiced by all personnel while performing the designated work.

- Place the proper containers for disposal of refuse and discarded material at appropriate sites during the designated work. These containers should be emptied daily to prevent the formation of hazardous conditions.

- It is important to establish efficient lines of communication between operations, management, and the personnel performing. The actual work, in order to effectively develop the proper procedures and methods to safely accomplish the designated work and to implement actions in case of emergencies.

- If workers directly involved in the hot work or vehicle entry are changed, a new permit must be issued upon complete inspection and testing of the work-site.

- Contractors or Employees:

  - Can only perform the specitic work designated by the permit.
  - Can only use approved access routes when bringing equipment and vehicles in and out of the process area.
  - Must notify the Authorized PTSI Representative immediately upon completion of the work.

- No hot work or vehicle entry is permitted in prohibited areas designated by the Authorized PTSI Representative, or in areas that do not comply with the standards and codes referenced in this permit.

- If an unsafe condition (i.e., spillage of combustible materials in the area, heavy fog, unusual odors) occurs in the immediate or surrounding area of work, immediately stop hot work and shut down all vehicles and equipment. Do NOT restart work or vehicles and equipment until a new permit is issued.

- All hot work and vehicle entry in an affected area must stop, and all personnel in the area must leave immediately upon being notitied of an emergency alarm situation. They will not be allowed to retum until the site is inspected and retested and a new permit issued.

  Important: The fact that a Hot Work/Vehicle Entry Permit is issued for performing the designated work in no way relieves the affected persomel of their responsibility for the safe execution of their work. If any unsafe condition exists, work should stop immediately, and the condition reported to the Authorized PTSI Representative.

4.2 Conditions Requiring a Permit

- Situations where any potential ignition source is used or contemplated in locations and areas where flammable conditions could exist, are subject

to the requirements of a Hot Work/Vehicle Entry Permit. ***Note:*** Refer to section 1.2 Definitions for a list of potential ignition sources.

- Where and when Hot Work Permits are required and NOT required as shown in the table below:

Hot Works Permit (Required) – Within 35 feet of process areas. Within 50 feet of storage tanks containing flammable or combustible materials.
Hot Works Permit (NOT Required) – In areas outside the areas listed in the Required Column, if the potential for the presence of flammable or combustible materials does NOT exist.

Where and when Vehicle Entry Permits are required and NOT required as shown in the table below:

Vehicle Entry Permit (Required) - To enter any barricaded areas within 15 feet of process equipment or pipe racks that contain flammable liquids or gases where defined roadways do not exist. Within diked areas of storage tanks containing flammable or combustible materials.
Vehicle Entry Permit (NOT Required) – When trucks are entering or leaving product loading areas and ignition sources are kept a minimum of 15 feet from product transfer.

- Vehicles or equipment powered by interual combustion engines, or by devices that produce sparks or contain hot metal surfaces, are subject to the requirements of a Vehicle Entry Permit. In addition to cars and trucks, the following vehicles and equipment are also subject to the requirements of a Vehicle Entry permit:

  - Cranes, forklifts, and loaders
  - Lawnmowers and weed-eaters
  - Generators and air compressors
  - Backhoes
  - Water pumps
  - Other engine-powered equipment

- Special caution should be taken with vehicles equipped with catalytic converters. These vehicles should avoid tall grass whenever possible.

- The Authorized PTSI Representative designates access routes for motorized equipment on the permit under "Special Procedures," after testing has determined them to be safe. These access routes cannot be deviated from during the course of the Vehicle Entry Permit.

5.0 PERMIT ISSUANCE PROCEDURE

Follow this procedure to obtain a Hot Work/Vehicle Entry Permit:

- **Initiate Contact with Authorized PTSI Representative:** Before a Hot Work/Vehicle Entry Permit can be issued, the personnel involved in the designated work or entry must initiate contact with the Authorized PTSI Representative to begin the permit process. Initial information and planning are conducted at this initial contact.

- **Perform a Preliminary Inspection of the Area or Work-site:** After initial contact is established, the Authorized PTSI Representative performs a preliminary inspection of the area or intended work-site to determine if the activity requires a Hot Work/Vehicle Entry Permit.

- **Inform Affected Personnel:** After the initial contact and preliminary inspection are completed, the Authorized PTSI Representative informs affected personnel of his findings and subsequent plans for site preparation or non-issuance of a Hot Work/Vehicle Entry Permit.

- **Prepare the Site: If,** in the opinion of the Authorized PTSI Representative, the activity requires a Hot Work/Vehicle Entry Permit, site preparation takes place.

- **Inspect and Test Site:** After site preparation, the site must be inspected and tested by the Authorized PTSI Representative to ensure a safe atmosphere and environment exists in which the work can proceed.

- **Inform Affected Personnel of Impending Activity:** Once the site is determined safe by the Authorized PTSI Representative, personnel affected by the work, or those having responsibility for the work area (Designated Operator and Designated Construction Representative), must be notified of the impending activity.

- **Issue Permit:** At this time, the Authorized PTSI Representative writes and issues a Hot Work/Vehicle Entry Permit, authorizing the work in compliance with the requirements of the facility, NFPA 51 B, and OSHA Standard 29 CFR 1910.252(b). The 'Scope of Work' section of the permit should provide detailed information on the equipment that can be worked on, the type of hot work tools that can be utilized, or the area that a vehicle can enter. The information provided should be restrictive in that it limits the hot tools that can be used or the equipment that can be worked on. The 'Special Instructions' section of the permit shall be utilized to provide written instructions of requirements for 'Prevention and Protection' (6.0) and 'Precautions' (7.0) sections of this standard.

- The permit is valid for the duration stated on the permit document and must be issued immediately before work begins. The issued permit must be signed by the Authorized PTSI Representative, the Designated Operator, and the Designated Construction Representative.

A new permit will be required in the event:

- A change in construction personnel occurs.

  Or

- Work is stopped for any emergency, such as spills, leaks, or operational upsets.

  Or

- The work-site is left unattended for ***more than 30*** minutes and new personnel are involved with the intended work.

- Re-issue Permit: In order to re-issue a permit, the site must be re-tested and re-inspected by the Authorized PTSI Representative assigned to that project. If the assigned Authorized PTSI Representative determines the work-site is safe for continued work, all affected personnel must be informed of the impending work and the permit re-issued for the stated time.

  The re-issued permit must be initialed by the Authorized PTSI Representative, Responsible Operator, and Designated Construction Representative.

A permit will be re-issued in the event:

- Work has continuously progressed but a change in the Responsible Operator, the Authorized PTSI Representative, or the Designated Construction Representative occurs (such as shift change).

  Or

- The work-site is left unattended for any period of ***more than 30*** minutes, and it is desirable to resume the work with the same operations and construction personnel.

- Post Permit: The original permit must be prominently posted at the designated work-site and a copy kept on file with the Authorized PTSI Representative until completion of the assigned work, or until work is stopped for the above stated reasons.

A copy of the permit must be:

- Maintained by the on-duty operations personnel for the duration of the permit.

- Kept on file at the facility for a period of *one year* following completion of the designated work.

6.0 PREVENTION AND PROTECTION

While it is sometimes impossible to completely eliminate all potentially hazardous conditions, every reasonable precaution must be taken to prevent ignition sources from contacting flammable materials or mixtures.

The Authorized PTSI Representative determines the requirements covering:

- Fire Fighting Equipment and Fire Watch
- Hazards
- Personal Protection
- Special precautions to be taken

6.1 Fire Fighting Equipment and Fire Watch

- Position fire fighting equipment as instmcted by the Authorized PTSI Representative, so it is readily available in the event of a fire.
- Place fully charged and operable fire extinguishers of the appropriate type in advantageous areas at the work-site.
- Fire watch attendants, knowledgeable in fire fighting techniques and about the available equipment, facilities, and emergency procedures of the facility, are required whenever major hot work operations (those involving sparks and flame) are performed in process areas or within 35 feet of such areas.
- Whenever hot work is performed outside the boundaries listed above, the Authorized PTSI Representative is responsible for determining if the need for fire watch attendants complies with the requirements outlined in OSHA Standard 29 CFR 1910.252(a) and NFPA 51 B.
- Fire watch attendants must be fully instmcted on the specific hazards of the area and have the authority to stop hot work operations if a hazardous condition develops.

- Where a fire watch is required, the fire watch must ensure that the potential for ignition will not be present after the job has been completed.

6.2 Hazards

- All movable equipment considered a fire hazard in the designated work area must be removed to a safe site. However, if the equipment is NOT movable, implement suitable precautions, such as fire-proof guards around the hot work object(s), to confine heat, sparks, and slag, and to protect the immovable object(s) from the hot work involved. Take extra care to protect the area below when hot work is performed at elevated work-sites, such as pipe racks.

- Properly guard with fire blankets, fire-proof shields, or seals such immovable hazards as:

  - Sewers
  - Vents and ducts
  - Sumps and drains
  - Open-ended piping
  - Hydrocarbon pumps
  - Valves and valve packings
  - Unions, seals, and flanged gaskets
  - Open doors and broken windows
  - Floor openings, cracks, or holes

- Pay special attention to pressure relief valves that relieve to the atmosphere and can introduce flammable and combustible material into the area.

- All combustible material, including, but not limited to the following, must be moved ***at least 35*** feet from the hot work site, or when not practical to be moved, must be protected with flame-proof covers, metal shields, or fire resistant guards or curtains:

  - Refuse

- Paper
- Cartons
- Loose wood
- Open dmms
- Combustible walls or partitions
- Grass or weeds

- Grounds and floors must be kept clean of combustible materials (such as fibers, wood shavings, straw, debris, or paper clippings) and swept clean for a radius of *55* feet from the hot work site. Keep combustible grounds and floors wet or suitably shielded to prevent ignition.

- Hot work cannot be undertaken on pipes, walls, ceilings, roofs, or other metal stmctures that have combustible coverings, or are close enough to such coverings to cause their ignition by heat conduction without taking additional precautions.

- Water spray is recommended, (where available), to quench hot metal, sparks, and slag during hot work operations, such as cutting, welding, and grinding.

6.3 Personal Protection

- Take suitable precautions during hot work operations to ensure protection against the safety and health hazards presented by the specific work involved.

- Personal clothing and equipment wom and used by personnel while on PTSI premises must be suitable for the intended work. At a minimum, personal clothing and equipment should meet the specific requirements of the work-site, as determined by the Authorized PTSI Representative, and must comply with OSHA Standard 29 CFR 1910 Subpart I, "Personal Protective Equipment."

7.0 PRECAUTIONS

The Authorized PTSI Representative determines:

- Equipment precautions
- Special precautions

7.1 Equipment Precautions

- Ensure that the following items are in satisfactory operating condition and in good repair:
  - Welding leads
  - Electrodes
  - Torches
  - Hoses
  - Extension cords
  - Portable tools
- To prevent accidental contact during any period of substantial work suspension, such as lunch breaks or overnight, disconnect welding electrodes and turn machines off.
- Also turn off torch valves during work suspensions to avoid accidental leakage of gas into the area.
- Equip cutting torch hoses with check valves on the regulator outlets.
- If the hot work involves confined spaces, remove hoses and torches from the spaces during work stoppages, where practical.
- Place welding machines and oxygen and acetylene bottles and their associated hoses in a safe, secure location where they are not exposed to sparks, flames, or hot metal.
- When scaffolding is required for the execution of hot work it must be supplied with a fire extinguisher and inspected by the Authorized PTSI

Representative before personnel are allowed to enter the scaffolding for hot work operations.

7.2 Special Precautions

- Do NOT attempt hot work on compressed air lines or vacuum lines while they are in service. They must first be removed from service and subjected to the same requirements as hydrocarbon lines.

- Hot work procedures and requirements for Hot Tap welding on pipes or vessels should conform to API Publication 2201, "Procedures for Welding or Hot Tapping on Equipment Containing Flammables."

- To minimize the risk of bum-through, a competent person must thoroughly inspect and verify that the metal thickness and quality are adequate for the pressure and temperature involved in the designated work. Findings and recommendations must be documented on the Permit.

- Lines must have adequate flow through them, or allow expansion into a vessel. ***At least*** three feet of liquid head must be maintained above hot work on tanks and vessels.

- All personnel involved in hot work must be qualified and competent to use the equipment and procedures required to ensure that proper safety conditions are met.

- Where possible, remove all flammable and combustible material on vessels with intemal equipment. Where impossible to remove, cover materials that are in locations where sparks may fall or vapor emissions may arise.

- If hot work requires entry into a confined space, atmospheric tests must verify an atmosphere in which the oxygen content, toxic and flammable vapors are within the safe limits described in OSHA Standard 1910.146(b). All pertinent safety precautions for confined space entry must be met (refer to PTSI Confined Spaces SOP).

- Give special consideration to conditions involving ignitable scale deposits, waxes, and other deposits that can accumulate on surfaces of vessels and piping and go undetected by vapor analyzers, but can create hazardous vapor conditions when heated.

- When pyrophoric deposits, such as iron sulfide, are located in vessels, take special precautions to prevent the spontaneous combustion of these materials if they are allowed to dry out and react with the oxygen in the air.

- To control the reacfion process, dissipate the heat involved until the atmosphere inside the vessel is below the flammable range, or isolate the deposits from oxygen. Use of water spray will reduce the heat of the reaction and help isolate the pyrophoric deposits from the oxygen present during the vapor-freeing procedures.

- Document these precautions on the permit.

8.0 SITE PREPARATION

The Authorized PTSI Representative determines the requirements for:

- Isolation - gas freeing

- Cavities or containers - venting and purging

- Testing

- Removal of, or protection for, combustible materials

8.1 Isolation-Gas Freeing

- Before opening vessels, tanks, piping, or other equipment in preparation for hot work, pump and drain off all residual liquid product to the lowest possible level. Pumping and draining can be augmented by adding water through existing piping connections (**NOT** through a roof opening) to help float away any residual product.

- After emptying a vessel or piping of as much residual liquid product as possible, the vessel or piping may contain gas under pressure. To vent this gas, select a method that results in the minimum possible concentration of gas in the surrounding atmosphere. Control of ignition sources during this procedure is essential.

- Flaring and venting are the two preferred methods of depressurizing vessels and piping. The venting method selected depends on local conditions at the time.

- Use flare or gas-collection systems where they exist. However, at locations with no such systems, flares or vent stacks can be constructed and used under controlled circumstances by competent personnel.

- After a vessel is depressurized, disconnect and blank or blind off connections to other vessels and piping at points as near as possible to the hot work site. Where disconnection is NOT practical, use blinds by first closing all valves nearest the work-site, breaking the connections, and inserting blinds.

- **B**lanks or blinds must be of sufficient size and thickness to withstand the maximum pressures they could be subjected to during the course of the work. **Be**fore blinds are installed, all **l**ines between the vessel to be worked on and the location of the blinds **s**hould be drained or **f**lushed.

- Lockout/tagout procedures should take place at this time, isolating the hot work area from power sources and relieving those sources of all residual power that may present a hazardous situation at the work-site. *Note:* Lockout/tagout procedures must comply with the requirements of OSHA Standard CFR 29 1910.147 and with PTSI's lockout/tagout SOP.
- Also verify that the hot work object(s) are properly grounded to prevent stray currents from introducing hazardous conditions into the area.

- After a vessel or piping is emptied of residual product, blinded off, and electrically and mechanically isolated, free it of hazardous vapor. In the initial stage of vapor freeing, closely monitor ignition sources and keep

maintenance in the surrounding area to a minimum. Since most hydrocarbons are heavier than air, discharging the vapor at a high elevation is one way to reduce the possibility of hazardous conditions outside the vessel or piping. This allows for maximum dissipation of vapor and reduces the potential of vapors reaching sources of ignition or of human exposure.

- Displacement methods of vapor-freeing depend on such factors as site location, equipment to be worked on, and the type of vapors to be displaced. Displacement methods include:

  - Mechanically - assisted fans or eductors
  - Natural convection
  - Steam-out
  - Inert gas purging
  - Chemical cleaning
  - Water flooding

- If the mechanically ventilated displacement method is selected, mechanical air-vapor movers must be suitable for hazardous locations and be electrically bonded to the grounded vessel or piping that it is vapor displacing.

- Since there are hazards inherent in the natural convection displacement, steam-out, chemical cleaning, and water flooding displacement methods, they should be used with caution.

8.2 Cavities or Containers-Venting and Purging

- Thoroughly clean all used containers, whether drums, tanks, barrels, or others, to ensure no flammable materials or substances are present that, when heated, might produce flammable or toxic vapors.

- Disconnect or blank any pipelines or connections to the container before proceeding with hot work.

- Vent all spaces, cavities, trenches, or containers to permit the escape of air or gases before allowing hot work.

- Pay special attention to the types of containers and areas where hydrocarbon vapors can migrate to and collect, creating extremely hazardous conditions. Periodic testing of these containers and areas is highly recommended.

8.3 Testing

- Under no circumstances should hot work be permitted when levels of combustible gases are at or above **10% LEL.** The goal of the Authorized PTSI Representative is to ***reduce*** the presence of combustible gases in the hot work area to a level of <10% LEL ***before*** hot work begins, and to ***maintain*** the level below <10% LEL ***during*** the execution of the designated work.

- Persons responsible for measuring the atmospheric concentrations of oxygen, combustible gases, and toxicants must be knowledgeable in the use and care of testing equipment, as well as in the procedures required to determine if conditions are safe for hot work and/or vehicle entry.

- Before using test equipment, the user shall verify that test equipment is in working condition and is properly calibrated. Recalibrate test equipment frequently (according to the manufacturer's instructions). When recalibrating test equipment, use a gas of known concentration, appropriate for the combustible gases being tested.

- Perform tests for oxygen concentration first. Tests for combustible gases will be invalid unless oxygen is present in ***at least*** a 10% concentration. ***Note:*** See the manufacturer's operating manual for actual limitations. Oxygen analyzers normally measure oxygen from 0% to 25%.

- Test frequently for combustible gas levels to assess the progress of the vapor-freeing process on vessels, piping, or equipment.

- Also, frequently test the area surrounding the work-site and equipment being worked on to ensure combustible gases are not accumulating in the area. ***Note:*** Combustible gas analyzers are commonly known by various

names, such as sniffers, gas testers, and vapor indicators, and are usually calibrated in percent of the LEL of the vapors present in the atmosphere. For example, if a combustible gas has an LEL of 4%, and the analyzer dial has a range from 0% to 100%, then 100% represents the LEL, or 4% of vapor in the air. (Refer to the manufacturer's operating manual for precise instructions.)

- Test for toxic substance concentrations by using Photo ionization Detector (PID) equipment, or a variety of self indicating Draeger detector tubes. The response times and accuracy of these indicators may vary widely, and the user must understand the use and limitations of these instruments.

- If hot work is to be performed, the wind direction must be considered and monitored frequently to prevent the area from being contaminated by wind-blown vapors. Permit issuance may depend on the wind direction at the time of the designated work. All affected personnel must be continuously made aware of the wind direction.

- If any conditions change (i.e., hydrocarbon releases, unit upsets, heavy fog) during hot work or vehicle entry, and the change could reasonably affect the concentrations of vapors in the area. Immediately cease all hot work and equipment or vehicle operation in the area and request that the area be re-tested and the permit validated.

- When hot work is to be performed in confined spaces, the person performing the testing must wear proper respiratory and protective equipment during the test procedures, until the following atmospheric conditions are met:

  - The oxygen content is between 19.5% and 23.5%.
  - Combustible gas concentration registers *less than* <10% LEL on calibrated test equipment, with preferred concentrations at 0% LEL.
  - The confined space(s) has NOT contained leaded gasoline or has been previously declared lead-hazard free.
  - No toxic substances are present at levels above the established exposure limit values. ***Note:*** Consult MSDS or OSHA Standard 29 CFR 1910.1000.

1.0 SCOPE

This program establishes the methods and procedures to provide for the safety and health of employees working in the facility. These procedures are designed to ensure work areas are safe for employees, but also to make employees aware for the potential hazards associated with operations and work areas.

2.0 RESPONSIBILITIES

- Facility Management

  Facility Management is responsible for the development and revision of this Program as to comply with applicable federal and state laws and regulations as well as with local operating needs. Management is responsible for confirming that the provisions and applications of this program are implemented on a facility wide basis.

- Terminal Manager

  - The terminal manager will ensure that an evaluation is made of the facility and associated operations to determine which work requires safe work permits and see that exposed employees are informed of areas where safe work permits are required.
  - The terminal manager will implement and enforce the provisions of this program in areas of operations and will ensure that facility employees are trained in the requirements of this program.

3.0 TYPES OF WORK REQUIRING SAFE PERMITS

- <u>Breaking Into/Unheading Equipment</u>
  Breaking Into refers to the disconnecting, unheading or opening of equipment which has been in service, or has the potential to be pressurized, energized or contain a hazardous material. A Safe Work Permit must be issued before such work is begun, to assure that potentially hazardous conditions are minimized.

- **Examples of Breaking Into Equipment Are:**
  - Unflanging of lines,
  - Removing blind flanges,
  - Installing or removing isolating blinds,
  - Breaking unions,
  - Removing pump or compressor runners,
  - Removing or breaking bonnets,
  - Opening vessel or tank manways, and
  - Disconnecting manifold piping.

- **Maintenance/Repair on Electrical Equipment**
  Opening electrical breaker switch boxes or any work requiring opening of electrical equipment. Such work requires the power to be shut off. If the equipment being broken into cannot be de-energized, a properly signed Hot Work Permit shall be issued rather than a Safe Work Permit.

- Work in high noise, vibration, or temperature areas.

- Excavation Operations.

- Work at elevated locations (where walkways or work platforms are not available.)

- Work which has the potential to expose employees to toxic substances (i.e. some non-routine sampling or gauging operations which pose an unusual hazard, opening lines and manways, etc).

4.0 REQUIREMENTS

4.1 General

- The Terminal Manager, Shift Supervisors and other Company employees who have been properly trained, may issue Safe Work Permits. Training must be documented and these records maintained.

- A Safe Work Permit shall be properly prepared and issued to company employees and/or contractors in accordance with the following instructions *before* work is performed, where an element of hazard may

exist. Personnel issuing Safe Work Permits shall comply, with all instructions contained herein and personnel receiving Safe Work Permits must abide by the conditions of the permit.

- All Safe Work Permits shall be signed by an authorized company employee and signed by an authorized maintenance/contractor representative.

4.2 Responsibilities

- It shall be the responsibility of the person responsible for the job, to obtain a Safe Work Permit prior to performing work requiring opening or disconnecting equipment.

- The signer and co-signer of the permit shall ensure themselves, that the equipment to be worked on is safe for breaking into. This shall include, but not limited to, locking-out, blocking-in, depressurizing, draining and or de-energizing equipment and utility before permits are issued.

4.3 Requirements

- When breaking into or blinding lines, tanks, vessels, pumps, compressors and other equipment in chemical service, protective equipment is required. This may include rubber suits, rubber gloves, face shields, goggles and rubber boots.

- The location of the nearest ***Safety Shower*** and ***Eyewash Stand***, shall be determined prior to starting work. When performing work in a remote area of the Facility or where no stationary emergency equipment is available, a portable, emergency eyewash fountain shall be provided.

- Either portable emergency equipment or stationary running water shall be available within the work area for immediate emergency use.

- When breaking into equipment, the permit shall state the contents of the equipment, so maintenance personnel may fully evaluate the need for additional precautionary measures or protective equipment.

- When initially breaking into or blinding lines and equipment that may contain toxic materials such as hydrogen sulfide (a possible contaminant in Bunker or #6 fuel oil), use of the following precautions must be fully evaluated and prescribed as necessary by the signers of the permit:
  - Respiratory protection equipment.
  - Protective clothing including gloves, boots, face and eye protection.
  - The need for a Safety Watch.
  - Continuous supervision while the job is underway.
  - The partial removal of flange or head bolts which is referred to as "hot-bolting" requires a Safe Work Permit.

- Cold Cutting/Drilling Into Lines and Valves

  - If a line cannot be made gas free, the line may be cold cut if it has been emptied and depressurized. A pneumatic saw or pipe cutter shall be used. When drilling into valves that cannot be made gas free, a pneumatic drill shall be used. The contact point of the saw, pipe cutter or drill must be lubricated with water, oil or grease. Accordingly, a Safe Work Permit must be issued before such work is begun, showing results of gas tests and listing all precautions to be taken, to assure that potentially hazardous conditions are minimized.

- Planning for Safe Work

  - Planning for Safe Work is very important to help ensure that the work is carried out safely and efficiently. Some kinds of work, which require gas testing, should always be performed by qualified persons.

5.0 SAFE WORK WHICH CAN BE PERFORMED WITHOUT PERMITS

- Tank Gauging and Sampling.

- Normal Housekeeping.

- Minor adjustment to Instruments.

- Routine Instrument Repair and Calibration.

- Changing Oil in Pumps.
- Minor Mechanical Repairs.
- Scaffolding in a Nonhazardous Area.
- Insulating in a Nonhazardous Area.
- Painting (No Power Tools in Hazardous Area).
- Hand Painting using brush/roller at ground level or off a ladder or scaffold.
- Connecting and disconnecting hoses for truck, rail, and barge transfers.

6.0 DURATION OF SAFE WORK PERMITS

Safe Work Permits will normally be issued for the current shift or a part thereof If the work exceeds 8 hours, the permit may be made for the scheduled shift (12). If the authorized signer of the permit determines an extension of the permit is necessary, the permit may be reissued or extended. If permit extends over one shift the work area shall be inspected at beginning of incoming shift to ensure conditions have not changed.

One-Day Permits

When work is planned continuously over an extended period and the equipment can be maintained in a safe condition (e.g., tanks cleaned out, blinded and gas-freed), Safe Work Permits may be issued to cover a period not exceeding 24 hours, starting with the moruing shift.

7.0 PREPARATION OF THE WORK SITE

Responsibility

Personnel authorized to sign Safe Work Permits, shall be responsible for assuring that conditions on or around the vessels, tanks, lines, etc. are such

that work can be performed safely with regard to both personnel and equipment. This includes insuring the proper condition of the equipment and appropriate waruing, personnel protection, and any other precautions that may apply.

Examples of Precautionary Measures (Not All Inclusive):
Precautionary Measures shall include the following: pumping; stripping; draining; removing product; disconnecting; blinding off; steaming and washing to gas free; ventilating; testing for combustible and toxic gases; and isolating all outside sources of gas, steam and chemicals.

The power source to these devices must be made inoperative by disconnecting, blocking or locking out switches when working on or removing power driven equipment. (Refer to Lockout/Tagout Program).

Personnel signing Safe Work Permits for work involving known hazards shall be responsible for specifying personal protective equipment such as goggles, face shields, rubber gloves, rubber boots, and appropriate respiratory protection.

8.0 FINAL INSPECTION

Final inspection of the work site must be made by the signer, just prior to the start of work. The results of the inspection and a review of the safety precautions must be discussed with the person to whom the permit is to be issued.

9.0 GAS TESTING

9.1 Requirements

- The permit issuer should review both past and current uses of the work area to determine if gas and /or toxic material could have adversely affected atmosphere. In cases where there is a possibility of gases being present, appropriate tests to detect the presence of combustible and/or toxic gases or vapors such as hydrogen sulfide, shall be made by qualified personnel prior to issuing a Safe Work Permit. The person

making the test shall be responsible for stating the results of the tests, the time taken, and signing (not initialing) the Safe Work Permit.

- All gas tests and toxic material tests shall be done only by trained and authorized persons. Normally, such persons would include: Facility Managers and outside personnel who are trained in issuing the required permits and conducting all of the required tests.

- Test the work area with a calibrated direct reading instrument. Calibrate instrument daily or prior to being used and check for proper operation (this will also be documented). Follow manufacturer's instructions and recommendations for use and proper care.

- Combustible gas readings shall be 10% of the lower explosive limit (LEL) or lower for issuing Safe Work Permits.

  NOTE: A HOT WORK PERMIT SHALL NOT BE ISSUED IF THE PERCENT OF LEL IS MORE THAN 0.0%.

- If detectable concentrations of toxic gases are higher than the OSHA permissible exposure levels (PELs) (found in 29 CFR 1910.1000 Air Contaminants), appropriate respiratory protection must be used. Contact the EH&S Rep. for assistance in determining the appropriate level of respiratory protection.

9.2 Testing Procedure

- Gas test will be performed after all blinding, disconnecting, steaming and other preparatory work has been completed, and as near as possible to the actual start of work, ***definitely within two hours of starting.***

- The time that the gas test was taken shall be shown on the permit, and at no time will it be later than the time stated for which work, may begin.

- When work is not started within two hours of the time the original gas test was taken, another gas test ***must*** be made, results properly noted on the permit, the time shown, and signed by the person making the second test.

- ***In any case where a combustible gas condition may occur during the performance of work, a continuous gas monitor shall be used.***

- Gas tests for combustible vapors, oxygen, and toxic materials shall be made by personnel trained and authorized in the operation of the test equipment. Test will be performed by those authorized to sign permits, or those authorized under the combustible/toxic section.

10.0 PREPARATION OF THE SAFE WORK PERMITS

10.1 Requirements

- Preparation of the Safe/Hot/Tank Entry Work Permit shall be the responsibility of the person authorized to sign their permit.

- The original permit shall be issued to the person or group performing the job, and a duplicate copy shall be maintained in the permit book, and retained for one year. In case of an accident or Unusual Happening to which the permit is pertinent, the copy shall be maintained with the investigation file.

10.2 Mutual Understanding - Discussion of Precautions and Limitations

- All persons involved with the preparation and issuance of a Safe Work Permit must completely understand the nature of the work, and must be thoroughly familiar with the conditions, precautions and limitations, which must be observed. Further, this information must be conveyed to the craftsman actually performing the work in a clear and thorough manner.

- The signer of the permit must assure himself that the person or persons supervising or working the job, completely understand the conditions, precautions and limitations under which the permit is issued. In addition, they shall positively identify the particular equipment, line or tank where the work is to be performed. ***There Must Be A Mutual Understanding.*** Consequently, it is essential that the person issuing Safe Work Permits, have personal contact with the person receiving the permit.

10.3 Acknowledgment of Receipt of Permit

The person receiving the permit will be required to acknowledge receipt of the permit. This will require a signature on the original copy of the permit by a Company employee or outside contractor. The Company signer issuing the permit shall read the permit to the Company supervisor directing the job or Contract supervisor directing the work. The supervisor receiving the permit will be responsible to sign for the receipt of the permit then read the conditions, precautions and limitations of the permit to those under their supervision.

10.4 Multi-Craft Permits

A single Safe Work Permit for each work area may be issued to cover any number of workers, provided that the total number involved is listed on the line entitled "Number In Group" of the permit.

10.5 Display of Permits

Safe Work Permits must be displayed prominently at the location where the work is being performed (such as pump, flange, line or entrance into a tank farm). Permits shall be placed in a special plastic envelope cover provided for that purpose, and securely attached to prevent loss. The permit shall not be removed from the work site while work is in progress.

11.0 ALTERATION AND EXTENSION OF EXISTING PERMITS

Any additions or changes to the original permit shall require the agreement to and the initials of ***both the company employee and the maintenance/contractor*** responsible for the work at the time of the change. Before initialing, they must make absolutely certain that all safety requirements will continue to be met.

NOTE: Any alteration of a Safe Work Permit must be made on the original copy permit and on the duplicate copy that is kept in the permit book. This is necessary to ensure that the duplicate copy accurately reflects any alterations to the original permit.

12.0 REVOKING AND REINSTATING PERMITS

- Unexpected Hazards
  - In the event of an unplanned release of hydrocarbons or other hazardous conditions occurring, the first person noticing the hazard must notify the work crew immediately, stop the job, evacuate the area, then notify the Terminal Manager and Shift Supervisor, for assistance.

- Intermption by Facility Personnel
  - After a Safe Work Permit has been issued and Facility personnel find that conditions have or may become hazardous, for the continuation of work covered by the Safe Work Permit, it shall be mandatory that all outstanding permits be recalled, in the affected areas until necessary remedial steps have been taken, to permit resumption of work.
  - When work is intermpted or delayed for more than two hours or finished before the termination time shown on the permit, it is the responsibility of the maintenance forces to retum the permit to the issuing person, notifying that person that work has been discontinued, terminated, or completed.
  - Personnel that have issued permits by posting area permits must retrieve such permits at the expiration of the permit.

- Resumption of Work
  - In the event the intermpted work is resumed within the time limits of the original permit, the permit may be reinstated provided the signer and countersigner initial and note time of reinstatement. If the work has been delayed for more than two hours, or if conditions have changed, another gas test must be made (if applicable), and new permit issued.

13.0 SPECIAL CONSIDERATIONS

These instructions are general and cannot be expected to cover all possible conditions. These instructions are intended to serve as minimum requirements for safe execution of work, and are not intended to preclude more exacting requirements where deemed necessary. Should there be any doubt in the mind of anyone authorized to sign Safe Work Permits as to whether conditions are safe, they should withhold issuance of the permit and consult with the Terminal Manager or General Manager.

1.0 SCOPE

An elevated workspace presents a potential hazard to employees. The Elevated Workspace Standard provides guidelines for employees who perform jobs in and around elevated workspaces.

1.1 References

This Standard references, ***but is not limited to***:

- 29 CFR Part 1910.28, Safety Requirements for Scaffolding
- 29 CFR Part 1910.66, Power platforms for exterior building maintenance
- 29 CFR Part 1926.104, Safety Belts, Lifelines, and Lanyards
- 29 CFR Part 1926.451, Scaffolding
- 29 CFR Part 1926.500 Scope, application, and definitions applicable to Subpart M
- 29 CFR Part 1926.501, Duty to have fall protection
- 29 CFR Part 1926.550, Cranes and Derricks

1.2 Definitions

- Elevated workspace -- a work environment outside the protection of permanent or temporary guardrails more than six feet above the ground.
- Guardrails or handrails -- see Standard guard rail systems.
- Lanyard -- a rope or restraining device capable of supporting one person. One end is fastened to a safety harness; the other end is secured to a substantial anchor point.

- Qualified person -- a person who has received formal training in the use of fall protection equipment, and has practical experience (application) in the construction and use of scaffolding [fall protection systems, 1926.502 (h)(1)]

- Full-body harness (safety harness) -- a device wrapped around the trunk of the body (waist, shoulders, and legs). A D-ring located in the center of the back provides a connecting point for lanyards or other fall arrest connection devices. In the event of a fall, a hull-body haruess distributes the force of the impact throughout the trunk of the body-not just in the abdominal area of the person.

- Scaffold boards -- should be 2"x 10" or 2"x 12" scaffold grade lumber.

- Standard guard rail systems -- consist of a:

  - Top rail of 2"x 4" lumber (or equivalent material), approximately 42" above the walking/working surface
  - Midrail at approximately 21" above the surface
  - Toe board that is 4" tall, mounted at the walking/working surface

- Toe boards -- should be 1/4"x 4" metal or 2"x 4" nominal lumber #2 or better.

2.0 ELEVATED WORKSPACES

Any time an employee is working at a height greater than 6 feet, a fall hazard exists.

Where a fall hazard exists, there are two acceptable options:

- Eliminate the hazard.

  Or

- Provide protection against the hazard.

Ideally, it is best to totally eliminate the hazard. However, since that is often not possible, other measures, such as wearing personal protection equipment (PPE), are required:

- Near the edge of tank roofs, roofs of buildings, etc., that are not guarded by railings.
- Working from a boatswain's chair.
- Performing work on a ladder which requires the use of both hands.
- Working on scaffolding over six (6) feet high when handrails are NOT used.
- When scaffolding is 10 feet or higher, handrails, midrails and toe boards are required.
- ***Important:*** A lanyard must be attached to an anchorage other than the scaffold structure itself.
- Working from any temporary platform erected without handrails.
- ***Important:*** All temporary work platforms must be removed immediately upon completion of a task to protect employees from the danger of falling material.

Note: If you do not feel comfortable working at elevated heights which do not fall into the designation of "elevated workspace" (6 feet and above), take extra precautions and use the appropriate safety protection.

PTSI requirements:

- Employees in the immediate work area should be notified of work in the elevated workspace.
- Necessary barricades and signs must be erected to warn employees of the dangers of overhead work in the area.

3.0 FALL PROTECTION EQUIPMENT

Fall protection equipment must be:

- Worn any time employees occupy an elevated workspace.
- Stored in an identified location and readily accessible to affected employees.
- Inspected by the wearer prior to use.
- ***Important:*** During routine and periodic inspections of fall protection equipment, check the following items:
  - Inspect cable lifelines for fraying, broken strands, kinks, knots, etc.
  - Inspect hamesses for broken, cut, or bumed straps.
  - Check buckles to ensure they are free from damage.
  - Inspect D-rings and connectors (locking devices) for damage.
- Protected from excessive heat that can damage the material (i.e., steam lines, process piping, welding and cutting equipment).
- Protected from chemical contamination that can damage the material or cause irritation to the wearer.
- Disposed of immediately if it is damaged.
- Disposed of immediately if subjected to in-service overloading.
- Used only for its intended purpose.

4.0 SAFETY HARNESSES, LANYARDS, AND LIFELINES

Safety hamess requirements:

- PTSI requires the use of full-body safety hamesses rather than safety belts. The only exception is for elevated position work, such as a lineman's work.

- All safety hamess straps must be properly fastened when in use, including chest straps if so designed.

- Any safety hamess subjected to a full body fall must be replaced immediately.

PTSI requirements for lanyards and lifelines:

- Use only shock-absorbing (and/or retractable) lanyards with locking snap hooks.

- Anchor lanyards at a point waist high or above.

- While working in an elevated workspace, and moving from one work location to another, for 100% fall protection, use the two lanyard system.

- Secure lanyards and lifelines to an anchorage capable of supporting a dead weight of 5,400 pounds. The Qualified person shall inspect and approve anchorage points.

- Anchorage points must be free of sharp or rough edges.

- The maximum length of safety belt lanyards should provide for a fall of no greater than six feet.

- A lifeline of greater length than the lanyard, with a breaking strength of at least 5,400 pounds, can be used to extend the length of the lanyard when absolutely necessary.

- Lifelines can be horizontal or vertical.

- Any lanyard or lifeline that has supported a full-body fall must be replaced immediately.

5.0 SCAFFOLDING

5.1 Safety Guidelines

- Keep scaffolding equipment in good condition at all times. Take defective scaffolding planks, clamps, etc., out of service and repair or replace.
- Maintain scaffolds in a safe condition, and never alter or move horizontally while in use or occupied.
- Use solid footing at all times. Supports should sit on concrete, metal base, and/or planking. The scaffolding must be level.
- Do NOT support scaffolding in excess of 20 feet in height on wheels.
- Scaffolds must be capable of supporting, without failure, a load four times the maximum intended load capacity.
- Do NOT space legs or uprights over eight feet in distance.
- There should be a rest platform every 20 feet for scaffolds more than 32 feet high. The platforms must be a minimum of two scaffold boards wide. Rest platforms should have standard handrails, midrails, and toeboards as described in this Standard.
- Any alteration or modification to existing scaffolding must be performed by a qualified personnel.
- Mobile scaffolding 50 feet or higher shall be designed by a professional engineer.
- Any scaffold 125 feet or higher shall be designed by a Registered Professional Engineer.

- Employees are prohibited from working on scaffolding during a storm, in the event of high winds, or when the scaffolding is covered with ice or snow.

- Scaffolds must have screens between toeboards and midrails if workers are required to walk or work below scaffolding.

- Scaffolds ranging from 4 to 10 feet in height, having a minimum horizontal dimension in either direction of less than 45 inches, shall have standard guard rails installed on all open sides and ends of the platform.

5.2 User Guidelines

- Guardrails not less than 2 x 4 inch lumber or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1 x 4 inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height.

- Where there is danger of material falling from the scaffold, a wire mesh or other enclosure shall be provided between the guardrail and the toeboard.

- Each platform of the scaffold should be decked solid with no less than two scaffold boards, and more where possible. There shall be no gaps between the scaffold boards, or between the scaffold board and toeboard.

- Attach toeboards to the handrail vertical supports so that the toeboard is directly below the handrail and midrail.

- Provide scaffolds with appropriate ladders for ascending and descending.

- If ladders are attached, they should be on the ends of the scaffolding.

- Scaffold boards should fit the scaffold, and in no case extend more than one foot beyond the end support, and no less than six inches (unless designed otherwise).

- End-to-end scaffolding boards should overlap a minimum of 12 inches.

- Anchor or secure scaffold boards in place.

5.3 Scaffold Inspection

- Scaffolds shall be marked with the identity of the scaffold owner and/or builder.

- Individuals using scaffolding are required to work safely and in compliance with all OSHA regulations.

- Qualified persons are responsible for:

  - Ensuring safety compliance.
  - Approving scaffolding for "use" (green tag) and/or tag " not for use" (red-tag).
  - Adherence to the guidelines in this Standard.

- Contractor scaffolding shall be inspected by the contractor, with PTSI personnel reviewing the inspection. Contractors shall have personnel certified to inspect scaffolding.

1.0 SCOPE

It is PTSI policy that tank systems at the facility be managed in a manner that prevents tank overfilling. This standard provides the minimum tank overfill protection standards for aboveground and underground tanks used to store products or other hazardous chemicals. It is also PTSI policy to comply with all applicable national, state and local regulatory requirements.

1.1 References

This Standard references, ***but is not limited to***:

- API Recommended Practice 2350
- FAMM Standard Facility Practice No. SFP-28

1.2 Definitions

- **A**ffected **E**mployee – refers to any employee whose job requires the involvement in the delivery or receipt of products or other hazardous materials which are delivered to the facility.
- **A**tt**e**nded **F**acility – A facility that has assigned personnel continuously on the premises during receipt of product from a mainline pipeline or marine vessel. An unattended facility does not have assigned personnel continuously on the premises during receipt of product from a mainline pipeline or marine vessel.
- **A**uthority having **j**urisdiction – The organization, office, or individual responsible for approving equipment, an installation, or a procedure.
- **C**apacity – the volume (amount) of product contained in a tank at predesignated levels.
- **L**evel detector – a product level sensing device that actuates an inifial alarm/signal to provide sufficient time for operators to acknowledge or

respond to divert or shut off product flow before the product in the tank reaches a predetermined level.

- **H**azardous **m**aterial – refers to any material which is a physical hazard, environmental hazard or a health hazard.

- **M**ainline pipeline – A pipeline that transports petroleum products to and from marine vessels. Does not include pipelines used to transfer products within facilities.

- **M**arine vessel – A barge or tanker ship that deliyers product directly into petroleum facility tanks (usually through facility pipelines).

- **O**perator – The facility owner, manager, supervisor, or other assigned person(s) responsible for receiving product from the transporter.
- **O**verfill level – The maximum fill level of product within a tank as measured from the gauging reference point (that is, striker plate) above which level any additional product will overfill and spill out of the tank.

- **S**afe fill level – The safe fill level is the level up to which the tank is allowed to receive product at the maximum allowable receiving flow rate. The safe fill level is always below the overfill level. The safe fill level is established by determining the amount of time required to take the appropriate action necessary to completely shut down or divert product flow before the level of product in the tank reaches the overfill level. The safe fill level is established by operators for each specific tank and depends on the type of tank, its interual configuration and condition, and the operating practices.

- Tan**k** overfill protection – refers to any procedures, systems, instruments or other devices which are depended upon to prevent the overfill of a tank system from the delivery of products or other hazardous materials from pipelines, trucks, railcars, marine vessels, or transfers from other tanks via pumps and piping systems.

- Tan**k** product levels – Levels established by operators are based on (a) the field experience and operating practices for each facility and each specific tank; (b) the operating parameters for valves and manifolds; (c)

the tank capacities and physical conditions; (d) the amount of product to be delivered; and (e) the rate of product flow into each tank.

- Tank strapping chart (tank record) – A chart (or record) developed for each individual tank specifying the essential values related to tank capacity, normal fill level, safe fill level, overfill level and detector setting levels (see API standard 2250).

- Transporter – The mainline pipeline person or marine vessel who is responsible for product transfer operations.

- Transfer operations – All activities associated with product receipt, including the associated notification (either verbal, electronic, or by other means) of a potential tank overfill and shutdown or diversion of product to prevent a potential tank overfill.

2.0 RESPONSIBILITIES

- It is the responsibility of the Facility Manager to ensure that the facility complies with the minimum standards defined by this Standard and all applicable national, state and local regulations.

3.0 GENERAL REQUIREMENTS

- Tank overfill protection shall not be dependent upon inventory records alone.

- All tank vents and overflow shall discharge only into a secondary containment area.

- Spills or leaks from tank overfills shall be considered and be a part of the spill management program.

- Temporary and/or portable tanks shall also meet the tank overfill protection standards established in this SOP.

- All affected employees involved with receipt of products and other hazardous materials which are delivered to tanks at the facility shall be

trained on the tank overfill protection procedures. This training shall be performed for each new affected employee and at least annually to maintain proficiency.

- All contractors or other persons making deliveries to the facility tanks shall be briefed on the proper procedures for tank overfill protection.

- The facility shall maintain records to demonstrate appropriate tank overfill protection practices are being followed. These records shall include at a minimum:

  - Tank design and "as-built" drawings;
  - Formal inspection records;
  - Loading and unloading procedures;
  - Employee training records; and
  - Contractor (or other persons making delivery) briefing records.

- The safe fill level and overfill level for each tank in the facility shall be established and entered in the tank strapping chart. The levels shall also be prominently displayed by the operator near the tank gauge hatches and/or ground level gauges where manual operations are performed, or where manual operations are required as backup in the event of system failure.

4.0 PROCEDURES

- Before the product is transferred or received, a proper valve line-up shall be verified to ensure that the product will be delivered into the designated tank or tanks. Where piping is connected from the same receiving manifold to different tanks, care must be taken to ensure the following:

  - Only the inlet valves for those tanks designated to receive product shall be open.
  - The inlet valves for all other tanks should be closed.

- Prior to product receipt, the tank(s) designated to receive product shall be gauged manually by the operator, or by an independent automatic

gauging and measuring system, to confirm that adequate capacity is available to receive the amount of product scheduled for delivery.

- Any expected volume increase due to product temperature rise in the tank(s) shall be considered when determining the available room for product. This information shall be recorded on the tank product transfer or receipt form(s) and made available to the transporter, as appropriate.

- Where automatic gauging and measuring systems are used, regular inspection, maintenance, and checks of their capability and performance are required.

- During product receipt, frequent acknowledged communication shall be maintained between the operator and the transporter, to shut down or divert product flow, if necessary.

- The tank(s) designated to receive product shall be checked by the operator immediately after the start of product transfer to verify that product is flowing into the correct tank and that the gauging equipment, where installed, is operative.

- During product receipt, tanks shall be checked periodically by the operator to ensure that the product continues to flow into the correct tank and that the tank capacity remains sufficient to receive the amount of product scheduled for delivery. Gauge readings shall be taken and recorded when checking tanks during product receipt. The flow rate of product into the tank shall be calculated to determine the approximate fill time.

- If the receiving tank is empty at the begiming of the product receipt, the tank shall be gauged one hour after start verification in order to determine a flow rate.

- During product receipt, the tank farm area shall be periodically inspected by the operator to ensure the integrity of the piping, tanks, pumps, dikes and/or other containment and drainage systems, and to ensure that no unauthorized activifies are taking place that would affect product receipt.

- As the tank approaches the maximum fill, the flow rate shall be checked every 30 minutes.

- The operator or qualified person shall continuously monitor the product level for the last 20 minutes of the receipt.

- During this period, the assigned person shall be provided with a direct means of communication to the transporter, to notify the transporter to immediately stop or divert product flow in the event of an emergency.

- Monitoring shall continue until the transfer is complete, all product flow has stopped and the tank receipt valves are closed.

- At the conclusion of the receipt, the facility receiving system shall be secured. This includes closing tank inlet valves that were opened for product receipt, and where appropriate, closing the facility product receipt valve(s) or manifold valves, dock valves, and so forth.

5.0 PERFORMANCE MONITORING

Facility managers are responsible for performing periodic self-evaluations or facility inspections to ensure that the tank overfill protection program is being effectively implemented.

At a minimum, each facility shall:

- Perform periodic checks to ensure that tank overfill protection procedures and equipment are in place;

- Check tank inspection records to ensure that timely inspections are being performed on installed tank overfill protection equipment.

- Check training and briefing records to ensure that all employees, contractors, and other delivery agents are familiar with the tank overfill protection procedures; and

- Take effective corrective and preventative action where deficiencies are observed.

1.0 SCOPE

This standard operating procedure addresses waste management practices at all PTSI operated facilities. The goals of the Waste Management Program are to:

- Protect employee health and safety.
- Protect the environment.
- Reduce amount of waste generated.
- Comply with waste regulations.

1.1 References

This standard references, ***but is not limited to***:

- FAMM SFP-44, Waste minimization planning
- FAMM SFP-45, Solid waste management
- FAMM SFP-46, Hazardous waste management
- FAMM SFP-47, Used oil management

1.2 Definitions

- Hazardous waste – generally refers to a subset of solid wastes that, due to their characteristics, pose a threat to human health or the environment when disposed. For purposes of this SOP, hazardous waste will include any such waste that is specifically identified by a regulatory term such as dangerous wastes, toxic wastes, poisonous waste, etc.
- Solid waste – generally refers to any solid, liquid, and/or containerized gas that is a discarded material by being abandoned, disposed of, burned or incinerated; accumulated or recycled offsite.

- Used **Oil** – refers to any oil that has been refined from crude oil, or any synthetic oil that has been used, and as a result of such use, is contaminated by physical or chemical impurities

- **W**aste of concern – refers to any type of waste or by-product that experience indicates can create liabilities for the company if those wastes or by-products are mismanaged. These wastes include (but are not limited to):

  - Hazardous wastes
  - Used oil and oil filters
  - PCBs and PCB-contaminated materials
  - Asbestos-containing materials
  - Used antifreeze
  - **O**ff-spec products
  - Empty medium and large used containers
  - Slop oils
  - Wastewater which is trucked offsite
  - Waste fuels
  - Waste pain and painting wastes
  - Lead-based paint wastes
  - Waste pesticides, cleaners
  - Treated wood
  - Scrap process equipment, tanks, piping, etc.
  - Waste degreasers

  Wastes of concern do not usually include office trash, paper or plastic packaging materials, or construction/demolition debris which can legally be disposed of in local or municipal landfills. Wastes of concern also do not include wastewater which is discharged through a permitted system, natural flow, or other arrangement (e.g., discharges to a public sewer system, stormwater discharge, and/or permitted point discharge).

2.0 RESPONSIBILITIES

- It is the responsibility of the Facility Manager to ensure that the facility complies with the minimum standards defined by this Standard and all applicable national, state and/or local regulations.

- At a minimum each facility shall:

  - Ensure that all applicable laws and regulations are understood and being followed;
  - Ensure that waste inventory is in place and up to date;
  - Ensure that employees managing wastes are being properly trained; and
  - Take effective corrective and preventative action where deficiencies are observed.

3.0 SOLID WASTE MANAGEMENT

- Each facility shall develop and maintain an inventory of all wastes generated at the facility. The inventory shall include all solid wastes, hazardous wastes, toxic wastes, wastewater discharges, stormwater discharges, and other wastes of concern. The waste list must be updated annually.

- Garbage, food waste, sanitary waste, medical waste, infectious waste, and other putrescible wastes shall be stored in a safe and sanitary manner which prevents exposure to employees, contractors, or visitors, and which prevents propagation or harborage of disease, attraction of disease vectors, scattering by wind or precipitation, and/or the creation of nuisances.

- PTSI-generated "wastes of concern" which require offsite disposal, treatment, recycling, storage, transfer or other actions shall be shipped only to a waste management facility that has been approved by PTSI.

- Oily rags shall be disposed of in metal containers with lids.

4.0 HAZARDOUS WASTE MANAGEMENT

- Any hazardous waste hauler/transporter used by a PTSI facility shall be a reputable hazardous waste transporter with all of the required permits and licenses in place and current.

- All hazardous wastes transported offsite shall be properly packaged and labeled to meet the applicable hazardous waste regulations.

- All shipments of hazardous wastes will have some form of shipping record, including but not limited to a shipping manifest, bill of lading, or invoice which identifies:
  - The name, address, and telephone number of the generating facility;
  - The name, address, and telephone number of the transporter;
  - The name, address, and telephone number of the receiving facility;
  - The identity of the hazardous waste in each container along with hazardous properties;
  - The volume and/or weight of each container along with hazardous properties;
  - These shipping papers shall be kept at the facility for a period of one year.

- Containers and tanks that are used within the facility for the storage of hazardous wastes shall be compatible with the wastes being stored.

- When possible, hazardous waste containers shall be stored within a warehouse or other structure which provides:

  - A stable surface for container storage;
  - A roof to prevent contact with precipitation;
  - Secondary containment consisting of an impermeable floor and containment walls, dikes or berms. The secondary containment shall be of adequate volume to contain any reasonably possible scenario of spills or discharges.
  - Security from unauthorized entry or tampering

- Hazardous waste containers shall not be stored in roadways, trafficways, pathways or in any manner that obstructs a means of emergency egress.

- Hazardous waste containers shall not be stored over or near a surface water body without an adequate means of secondary containment.

- Hazardous waste containers and tanks shall be marked, labeled, tagged or otherwise documented as to the contents and hazards.

- Hazardous waste containers shall be stored with bungs, caps, lids, valves or other openings in a closed position, except as necessary to remove or add wastes.

- Hazardous waste containers and tanks shall be periodically inspected to ensure that the containers are properly labeled, closed and still in good condition with no signs of leakage.

- Hazardous waste containers shall only be moved or transferred within the facility by qualified personnel, using appropriate industrial vehicles or equipment.

- All PTSI employees involved in the management of hazardous wastes shall have an initial and annual training per the requirements of management. Training shall be provided to employees involved in hazardous waste transporting, manifesting, inspections, labeling, and container/tank management.

- Contractors performing work at the facility shall be subject to the same or equivalent standards for any hazardous wastes generated by the contractor on site.

5.0 USED OIL MANAGEMENT

- PTSI shall not accept any used oil generated off site unless it has been treated by a used oil recycling facility.

- Used oil that has been treated by a used oil recycling facility can be brought into the facility via tmck

- Every effort shall be made to keep treated used oil separated from the rest of the products in the facility.

- Used oil being stored on site shall be stored in tanks or containers which are in good condition and which are compatible with the used oil.

- Used oil shall be recycled for beneficial use whenever possible. Disposal of used oil shall be the altemative of last resort. Some examples of beneficial use include:

    - Shipping off site for re-refining or processing;
    - Shipping off site for fuels blending/energy recovery;
    - Used on site for machinery lubrication.

- Used oil shall not be given to, sold to, or otherwise distributed to the public or employees for personal use off site.

- Used oil shall not be placed in surface impoundments, used as a dust suppressant, or managed in other ways in which used oil is placed directly on the land or into surface waters.

6.0 WASTE MINIMIZATION

- Waste elimination planning includes but is not limited to:
    - Minimizing or eliminating wastes at the point of generation;
    - Recycling wastes on site within the process or facility;
    - Recycling wastes off site;
    - Treatment on site prior to recycling or disposal; and/or
    - Treatment off site prior to recycling or disposal.

- Solvent shall be reused in the laboratories with the aid of solvent reclaimers.

- Where practical and economical, office or administrative wastes shall be recycled. Examples of these types of wastes include:

  - Office paper;
  - Aluminum cans;
  - Cardboard;
  - Computer equipment/circuit boards;
  - Glass; and
  - Plastics.

- Scrap metal such as piping or equipment that has been removed from service shall be sent to a recycling facility.

- Oil samples collected from storage tanks, barges, trucks or railcars shall be added to a storage tank at the facility after they have been stored on site for a period of 90 days.

1.0 SCOPE

Excavation and trenching work presents serious risks to all workers. The greatest risk is "cave-in." Cave-in accidents are more likely to result in serious worker injuries or fatalities than other excavation-related accidents.

The purpose of the Excavation and Trenching Standard is to provide guidelines for ensuring the safety of all personnel involved in performing excavation and trenching work.

This standard is not intended to be used in the place of applicable ANSI, OSHA or industry standards which should also be reviewed.

1.1 References

This Standard references, *but is not limited to:*

- American National Standards Institute (ANSI), Z-87 for Safety Glasses and Z-89.1, Class **B** for Hard Hats
- PTSI, Confined Spaces
- OSHA Standards for Confined Spaces, 29 CFR Part 1910.146
- OSHA Standards for Construction Industry, 29 CFR Part 1926.650 - 652

1.2 Definitions

- **B**ell hole -- pipeline "jargon" for an excavation or manmade cavity in the earth's surface in which a pipeline or pipeline facility is installed or repaired. Also see **E**xcavation.
- **B**enching -- a method of protecting employees from cave-ins by excavating the sides of an excavation or trench to form one or more horizontal levels or steps, usually with vertical or near vertical surfaces between levels.

- **Cave-in** -- the separation of a mass of soil or rock material from the side of an excavation or trench, or the loss of soil from under a trench shield or support system, and sudden movement of the soil or rock material into the excavation or trench. Either by falling or sliding, in sufficient quantity that could entrap, bury, or otherwise injure and immobilize a person.

- **Competent person** -- one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions that are unsanitary, hazardous, or dangerous to employees, and has authorization to take prompt corrective measures to eliminate them.

- **Confined space** -- any space or enclosure:

  - Large enough for an employee to enter and perform assigned work

  - With a limited or restricted means of entry or exit (i.e., tanks, vessels, silos, storage bins, hoppers, vaults, and pits)

  - Not designed for continuous employee occupancy

  - With one or more of the following permit-required confined space characteristics:

    - Contains or has a potential to contain a hazardous atmosphere and/or has an internal configuration that could entrap or asphyxiate an entrant (by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section).

    - Contains any other recognized and serious safety or health hazards

- **Excavation** -- any manmade cut cavity, trench, or depression in the earth's surface formed by earth removal.

- **Fissured** -- soil material that tends to break along definite planes of fracture with little resistance, or that exhibits open cracks, such as tension cracks, in an exposed surface.

- **Hazardous atmosphere** -- explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or an otherwise harmful atmosphere that may cause illness, injury, or death.

- **Protective system** -- a method of protecting employees from cave-ins, material that could fall or roll from an excavation face or into an excavation, or the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

- **Ramp** -- an inclined walking or working surface, constructed from earth or structural materials such as wood or steel, that is used to gain access from one point to another.

- **Registered professional engineer** -- a person registered as a professional engineer in the state where the work is performed, and who is qualified in soil mechanics (geotechnical).

- **Shield (Shield system)** -- a structure able to withstand the forces imposed on it by a cave-in, thereby protecting employees within the structure. Shields can be permanent structures or portable-designs that move along as work progresses. Additionally, shields can be either pre-manufactured or job-built in accordance with OSHA 29 CFR Part 1926.652 (c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

- **Shoring** -- a structure, such as a metal hydraulic, mechanical, or timber system, that supports the sides of an excavation or trench, designed to prevent cave-ins. The shoring system must be adequate for the excavation or trench, adjusted snugly against the walls of the excavation or

trench, maintained well, and inspected frequently by a competent person. The shoring system must be especially inspected after rainstorms or other hazard-increasing occurrences.

- Sloping -- a method of protecting personnel from cave ins. Excavating to form sides inclined away from the excavation or trench to prevent cave-ins. The angle of incline required to prevent a cave-in varies due to factors such as soil type, environmental conditions, and application of surcharge loads. The walls of the excavation or trench must be sloped back to 1 and 1/2 horizontal to 1 vertical, or34°.

- Trench Box -- see Shield.

- Trench -- a narrow excavation made below the surface of the ground in which the depth is greater than the width, with the width not exceeding 15 feet.

2.0 RESPONSIBILITY

Each facility is responsible for instructing all personnel, specifically new or transferred personnel, in the significance of safe excavation and trenching procedures. This only includes anyone who is, or could reasonably be expected to be exposed to the hazards of excavations and trenches.

3.0 FIELD TEST FOR SOIL CLASSIFICATION

Where independent contractors are working on new construction in undisturbed soil, the contractors determine soil classification in accordance with **OSHA 29 CFR Part 1926.650-652. For** these cases, the contractors must be trained in soil classification and serve as the *competent person.*

Under all other circumstances, assume the excavation or trench is in a "Class **C**" soil and slope the excavation or trench at an angle no steeper than 1 and 1/2 horizontal to 1 vertical (34° slope measured from the horizontal).

If sloping is NOT possible, contact a PTSI manager, and use a trench box or other type of protective system to make the excavation or trench safe prior to entry.

EXCEPTIONS TO THE ABOVE RULE MUST HAVE PRIOR APPROVAL OF THE GENERAL MANAGER OR HIS DESIGNEE.

4.0 ELEMENTS OF SAFE EXCAVATION AND TRENCHING

The elements of safe excavation and trenching include:

- Training
- Completing the Safety Worksheet
- Preparing for Excavation and Trenching
- Determining Depth
- Classifying the Soil Type (assume "Class C" soil)
- Inspecting a Confined Space
- Excavating and Trenching Work Practices
- Using Shield Systems

4.1 Training

Keep *written* training records containing the names of employees and contractors, training dates, and course outlines.

4.2 Completing the Safety Worksheet and Checklist

Prior to the start of the job, complete the Excavation Safety Worksheet.

Note: Refer to the worksheet in the Appendix of this Standard.

4.3 Preparing for Excavation and Trenching

To insure the safety of everyone affected, prepare for excavation and trenching by:

- Surveying the area, making note of any pipelines, telephone cables, power lines (above or below ground), or other hazards.
- Utilizing the "one call system" before starting to dig.
- Whenever possible or necessary, notifying landowners of the possible hazards noted from the survey. Let them know that excavation and trenching is to take place in the area, and request their assistance in locating and marking lines and cables.
- Noting any buildings, structures, or other surface encumbrances that could affect the excavation and trenching site. Develop a plan for removing or dealing with this before the work begins.
- Marking and barricading the excavations and trenches.

4.4 Determining Depth

- Excavations and trenches greater than 20 feet deep requfre a *registered professional engineer to provide a design.* The professional engineer's written tabulated data must be kept at the site during the installation and construction of the shoring, and be accessible thereafter.

- When certified shields are used, it is not necessary to have a professional engineer provide a design and the tabulated data. However, in this case the shield must have a certification plate or stamp which gives the allowable depth for its use and the pounds-per-square-foot rating of the shield. If the certification plate is missing, the design drawings must be at the location. The shield should have a model or serial number matching the one on the design drawings so there is no doubt as to the authenticity of the shield or its use. The shield must be constructed by a certified welder and no modifications can be made to the design without written approval from the design engineer.

- If the shields are left in the excavation more than **24** hours, the shields must also be rated for " **Long Duration**" or **"Type C-30** feet" installations. This information will be addressed on the data plate.

- Excavations and trenches less than **20** feet deep require:

  - Exact locations of all utilities and pipelines.

  - Providing a means of support (i.e., sloping, benching, trench box, or shield) for any excavation or trench **5** feet or deeper.

  - Providing a means of support for ANY excavation or trench, regardless of depth, that can entrap or injure a person.

  - Protecting and supporting the area of the pipeline or other facility being constructed or repaired, as well as removing any hazard encountered.

  - Sloping the sides of the excavation or trench no steeper than **34°**, measured from the horizontal plane, **unless** there is prior approval by the Division Manager or his designee.

- Sloping all spoils piles with the same slope as the excavation or trench away from the excavation or trench, so that loose soil or rock from them will not roll into the excavation or trench.

- Placing the spoils piles at least 2 feet away from the edge of the excavation or trench. PTSI recommends placing the spoils piles 4 feet away or more where space and equipment allow.

- Constructing ramps or ladders in trench excavation that are 4 feet or more in depth, secured and extending 3 feet or more above grade, that allow easy personnel egress, and shall be located so as to require no more than 25 feet of lateral travel for employees.

- Using trench shields whenever necessary.

4.5 Classifying the Soil Type

With the exception of independent contractors working on new construction in undisturbed soil, PTSI employees will assume the excavation is in a "Class C" soil. Slope the excavation at an angle 1 and 1/2 horizontal to I vertical, no steeper than 34°.

EXCEPTIONS TO THE ABOVE RULE MUST HAVE PRIOR APPROVAL OF THE DIVISION MANAGER OR HIS DESIGNEE.

4.6 Inspecting a Confined Space

When a hazardous atmosphere exists or could *reasonably* be expected to exist in an excavation or trench, it is a *confined space* that must be inspected before employees can enter. Any excavation and trench deeper than 4 feet must be considered a confined space until inspection is completed.

Inspection of a confined space requires that a competent and trained person, wearing respiratory protection and any other safety equipment deemed necessary, test the atmosphere for:

- LEL (Lower Explosive Limit) greater than 10%
- Oxygen content less than 19.5% or greater than 23.5%
- H_2S levels greater than 10 ppm
- Benzene levels greater than 1 ppm (PEL)
- Any other hazard that MAY be present that is capable of causing death, incapacitation, impairment of ability to self rescue, injury, or acute illness

An entry permit is required and must be retained to document atmospheric readings. (Refer to PTSI Confined Space Procedure for guidelines and procedures to follow when working in a confined space.)

4.7 Excavating and Trenching Work Practices

When working in and around excavations or trenches:

- Prior to the start of the job, review the completed Excavation Safety Worksheet.
- A *competent person* must remain on the job at all times while work is in progress, making changes as necessary to insure site safety.
- **NO ONE WILL WORK ALONE IN AN EXCAVATION OR TRENCH WITHOUT OTHERS PRESENT IN THE AREA.**
- Locate an observer or standby person (the *competent person)* outside the excavation or trench to inspect for

evidence of possible cave-in or other hazardous situations anytime an employee is in an excavation or trench.

- On an as needed basis, but at least daily, the *competent person* completes a new excavation safety inspection checklist, which is filed with the job paperwork after the work is completed.

- Have readily available emergency rescue equipment, such as a breathing apparatus, safety harness and line, or a basket stretcher, when hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation or trench. *Note:* This equipment must be attended when in use.

PTSI employees and contractors must wear the following minimum safety equipment:

- ANSI approved hard hat

- ANSI approved safety glasses with side shields

- Appropriate work boots

Accumulation of water in an excavation or trench is a type of hazardous condition. **Remove** accumulated water and inspect the excavation or trench again before allowing work to continue. Additional safety precautions, such as, shoring or trench boxes, may be needed.

Inspect the excavation or trench prior to starting work and immediately after lunch, or after an interruption of activity or change in conditions that could affect the condition of the soil.

If for any reason, the excavation or trench appears unsafe, **STOP WORK.** The excavation or trench must be made safe before entering.

Do NOT, under any circumstances, enter any type of excavation (including, for example, a bell hole) or trench if it appears unsafe. **Do NOT** allow any other **PTSI** employee, contractor, or any other individual to enter any type of excavation that appears unsafe. If necessary, stop the job, call the **PTSI** manager and let them help correct the situation.

ALL EMPLOYEES have the authority to stop work if they believe an unsafe condition exists.

When a hazardous situation is identified, everyone must immediately exit the excavation or trench. Once necessary precautions are taken to eliminate the hazard and insure the safety of those working at the job site, personnel may return to the excavation with the competent person's approval.

Excavations or trenches deeper than 4 feet where oxygen deficiency or a hazardous atmosphere could exist are confined spaces. Testing for oxygen, flammability (LEL) and toxic gases (H2S, Benzene, etc.) is required in these excavations. Note: Even if an excavation or trench is **NOT** deeper than 4 feet, it may contain hazardous atmospheres and should be tested prior to entry if hazards are present or suspected.

4.8 Using Shield Systems

The use of shield systems requires:

- Training of personnel who use and handle the shield systems.
- The presence of properly rated hoisting equipment for handling trench shields.
- That pre-manufactured shields meet standards set by **OSHA** 29 CFR Part 1926.652 (c)(3) or (c)(4).

5.0 APPENDIX

APPENDIX A: Excavation Safety Worksheet

During first and subsequent visits to a construction or facility maintenance location, the compliance officer (or the site's safety officer or other competent person) may find the following questions useful.

1. Is the cut, cavity, or depression a trench or an excavation?
2. Is the cut, cavity, or depression more than 4 ft (1.2 m) in depth?
3. Is there water in the cut, cavity, or depression?
4. Are there adequate means of access and egress?
5. Are there any surface encumbrances?
6. Is there exposure to vehicular traffic?
7. Are adjacent structures stabilized?
8. Does mobile equipment have a waruing system?
9. Is a competent person in charge of the operation?
10. Is equipment operating in or around the cut, cavity, or depression?
11. Are procedures required to monitor, test, and control hazardous atmospheres?
12. Does a competent person determine soil type?
13. Was a soil testing device used to determine soil type?
14. Is the spoil placed 2 ft (0.6 m) or more from the edge of the cut, cavity, or depression?
15. Is the depth 20 ft (6.1 m) or more for the cut, cavity, or depression?
16. Has a registered professional engineer approved the procedure if the depth is more than 20 ft (6.1 m)?
17. Does the procedure require benching or multiple benching? Shoring? Shielding?

18. If provided, do shields extend at least 18 in (0.5 m) above the surrounding area if it is sloped toward the excavation?

19. If shields are used, is the depth of the cut more than 2 ft (0.6 m) below the bottom of the shield?

20. Are any required surface crossings of the cut, cavity, or depression the proper width and fitted with handrails?

21. Are means of egress from the cut, cavity, or depression no more than 25 ft (7.6m) from the work?

22. Is emergency rescue equipment required?

23. Is there documentation of the minimum daily excavation inspection?

1.0 SCOPE

This procedure establishes safe and accurate standards for conducting a flying switch.

1.1 General

A flying switch can be done when transferring from tank to tank, from a shore tank to a vessel or from a vessel to shore tanks. The term refers to changing tanks during a product transfer.

1.2 Procedure

- The most common type of flying switch at this facility is done during a receipt to shore tanks.
- If a second receiving tank is needed, then it is prelined up to a point where only one valve would be open to receive into the tank.
- That valve is then opened and a valve that is already being received on is closed.
- Flow movement can be determined either by gauge or by pressure.
- A PIC on the dock and the vessel should be standing by and can slow pumps as necessary or shut down in an emergency.

1.3 Safety

- Safe procedures should always be followed when performing any operation.
- With auto gauges and the saab system flying switches can be safe and accurate.
- Risk can be removed or changed by using common sense and not getting into a situation where problems can occur. Watch for plugged lines, a missed valve that wasn't opened or opening the wrong tank.

- The following are some of the variables and/or risk factors to take into account when conducting a flying switch.
    - The receiving rate- High flow rates and variable rates increase the risks.
    - Tank level – the closer to maximum fill the greater the chance of accident.
    - Accuracy – the need for accurate stop points influences the method of switching.
    - Weather – inclement weather can change all factors.
    - Communications – some ships are very good at communicating, others are not.
    - Distractions – other operations, mechanical problems, gaugers, line handlers, agents, fumes, H2S.
    - Human element – sick hurt, tired employees, ship crew or tankerman.
    - Competency – training and experience or the lack of it.
    - Tanks – the tanks being used are a factor, Tank 1 is further away and therefore harder to control.
- If at any time any of these factors make a flying switch unsafe, contact the terminal superintendent for further instructions.

1.0 SCOPE

This procedure establishes standards for the safe unloading of tank cars.

1.1 General

The railspur contains the equipment to heat and unload up to five (5) tank cars at one time.

1.2 Initial Procedures

- Identify the cars. Make sure the car and seal numbers match the shipping list. Do not continue without verification of this information.
- Close the flood valve on spill containment at the north end of the spur.
- Visually check the condition of all cars. Make sure valves are in closed position.
- Place "Stop – Tank car connected" sign in position.
- Open the tank car dome lids.
  * Caution: The surface irregularities of most tank cars can cause falls and severe muscle strains.
  * Caution: The oil may contain hydrogen sulfide (H2S) concentrations which are hazardous to your health. (See MSDS).
- Sampling: Obtain a one (1) quart, all level sample of each car per ordinary methods unless instructed otherwise.
- Note product heights in each car. Most cars have "2%" marks. Any cars that are at or near the "2%" mark should be noted for special handling and monitoring. These cars must be physically inspected every two (2) to four (4) hours to prevent spills due to expansion. All cars are to be checked every eight (8) hours while heating.
- Connect steam hose to steam inlet and supply maximum available steam to each car unless instructed otherwise.

1.3 Pump off preparation

- Vent cars by propping open lids.
- Inspect cap and valve area for defects, irregularities, and visible oil leaks.
- Remove cap slowly, checking for oil seepage or clues to a defective valve.
  *Caution: This is the single, most risky step in this operation. An uncontrolled release will occur if the valve is not closed when the cap is removed. Spills are extremely expensive and are hazardous to your health. Severe bums can be caused by hot oil. (See MSDS).
- Connect tank car adaptor.
- Connect hose to tank car adaptor. When making connections, check gaskets and connectors for condition. Replace as necessary.
- Check for leaks.
- Wire camlock ears at tank car adaptor.
- Safety check. Be sure the equipment is in proper working condition.

1.4 Pump-off

- Confirm start up with lead operator.
- Open pump suction and discharge valves.
- Open one hose valve and one tank car valve.
- Start pump.
- Check for leaks.
- Start additional car(s) as good judgement dictates.
- Monitor car(s) for continuity of flow, leaks and volume remaining.

1.5 Pump-off completion

- After stripping, close tank car valve and walk out hose while sucking air through it.
- Close hose valve.
- Clean camlock surfaces and replace cap on hose.
- Remove tank car adaptor.
- Replace tank car cap.
- Remove steam hose.
- Turn over placards.
- Secure tank dome lid by tightening all swing bolts with a wrench.
- Repeat above listed steps for each car except that it is customary to suck air through the last hose for 15 to 30 minutes to help clear the line back to the tank farm.
- Confirm end of pump-off with lead operator
- Close remaining hose valve and replace cap.
- Shut off pump.
- Close pump suction and discharge valves.

1.6 Finishing up

- On completion of the railcar unloading operation visually check any accumulated water for contamination before opening flood valve on spill containment.
- Make sure all steam and product hoses are in their proper places by the pipe line. Note that we must maintain a five (5) foot pathway from the closest rail to the nearest obstacle.
- Remove "Stop – Tank car connected" sign.
- Clean up all oily equipment and put away.
- Check condition of TCA's, wrenches, etc.
- Replace supplies as necessary.
- Bring trash back to dumpster.
- Turn off lights.

1.7 Paperwork and gauging

- Gauge and temp receiving tank(s).
- Provide return bill of lading for empties and fax to railroad.
- A complete computer bill of lading is required for each car.

1.8 Safety

- Awareness
- Requires the following Personal Protective Equipment: coveralls, safety glasses and gloves. A respirator may be required if product containing H2S is expected.
- Reading materials to include MSDS and SPCC Plan.
- Maintain effective communications.
- All operators must be trained in rail car operations.

1.0 SCOPE

This procedure establishes safe and accurate standards for conducting the transfer of products between shore tanks.

1.1 Procedure

- Gauge the designated transfer tanks from the top using the outage.
- Figure the capacity of the tank that you are going to transfer oil into using the normal maximum fill level.
- Figure the amount that you have to move into this tank making sure that there is room for the number of barrels you have been instructed to transfer.
- Figure the stop gauges for all tanks.
- Line up the transfer receiving tank starting with that tanks valve and line and going backward to the shipping tank. This will make the last move to start the transfer opening the discharge valve off the pump at the shipping tank.
- Open this valve and start the pump.
- Watch the pressure, be ready to shut down if any problem develops. When pressure is determined to be OK walk the line to the receiving tank and check the gauge for flow.
- If the transfer is being done through a meter, that may be used for a stop point and for verification of flow. Do not transfer through a meter unless you have to. In some instances a meter is required, such as multiple tank, simultaneous transfer.
- There are automatic gauges on most of the tanks as well as the Saab system to monitor flow rate by time and stop points. The Saab system is very helpful if used effectively.
- Most of the pumps are positive displacement. With this type of pump a flow rate will remain consistent.
- Most transfer procedures will be spelled out for both start and stop points. Attention should be paid to possible differences due to the type of product and/or the tanks involved in the transfer.

- Tanks 4 and 5 are set up to pump with little or no steam tracing on the transfer lines. Due to this, as well as expansion, these lines will need to be displaced with air after every use. This procedure applies to the heating or mixing of a circulating tank as well as transfers of product in or out.
- The amounts figured from a tank gauge are always used for the corrected accounting figures for all sales, receipts and transfers. Enter all transfer procedures on the bill of lading log and into the computer system.

1.0 SCOPE

This procedure establishes safe and accurate standards for conducting the transfer of product between shore tanks and a barge or marine vessel.

1.1 Procedure for Loading a Barge or Vessel

- Boom the barge or vessel.
- Get a temperature and gauge the tanks to be used for the load from the top using the outage prescribed for each tank.
- Check load quantities and blend amounts if using more than one tank and then figure stop points.
- Line up designated tanks and pumps to the last valve before the meters.
- Figure load times and meter correction amounts. This information is in part what should be commuted to the loading vessel.
- Dock and vessel PIC (Person in Charge) will obtain paperwork from the terminal lead operator showing name of vessel, load quantities, product specifications, product temperature and the delivery destination and time.
- Dock and vessel PIC conduct a face to face conference to discuss and pass on all information concerning the load, times, rates and communication procedures. A DOI (Declaration of Inspection) should be completed at this time with all items being discussed, verified and initialed. Include PIC full name and title as well as dates and times in the appropriate places.
- While the vessel PIC is putting together a load plan the dock PIC can drop the crane cable to the barge so that the hose can be hooked on and lifted to the dock manifolds to be connected by flanges. After connecting the hose to the loading manifold the crane cable holding the hose in place will be relaxed but still maintain the connection to allow for tide movement without putting all the weight on the hose or connection.
- When the barge or vessel PIC is lined up he will notify the dock PIC that he is open and ready to start.

- The dock PIC opens the valves on the dock and notifies the terminal lead operator that everything is ready to start the load.
- The lead operator opens the last valve at the meter, starts the pump and notifies the dock and barge PIC that they should be receiving product.
- This is the most important time to be on alert by all personnel. Watch the pressure. Watch for leaks.
- The dock PIC will connect a drip sampler to the loading line and carefully adjust the flow to obtain a representative sample taken throughout the entire course of the load.
- During the loading of the barge or vessel the PIC will be monitoring the loading tanks by gauge. The terminal lead operator will monitor the load through meters making adjustments as necessary if doing a blend. Maintain good communication between all personnel of running totals and load times.
- As the load nears completion the lead operator will give advance warning to the dock and vessel PIC of remaining barrels until total quantity is reached.
- Lead operator stops the load. Dock PIC will ensure that the hose is drained into barge tanks and close the manifold.
- Barge or vessel PIC will finalize gauges and quantities and verify with terminal quantities.
- Hose will be disconnected and lowered back on to the barge or vessel.
- Terminal lead operator will close tank valves, do gauging and enter the final gauges and temperatures on the bill of lading log and the computer system.
- If Tanks 4 or 5 were used in the load the lines will need to be displaced with air.
- Dock PIC will separate the drip sample, giving one to the barge PIC for delivery to the vessel and keeping two at the terminal sample storage. After testing and determining accuracy on the terminal sample for viscosity and API gravity, the barge may be released.
- Remove the boom.

1.2 Procedure for Receiving from a Barge or Vessel

- You will be informed of the following information prior to the arrival of a barge or vessel.
  - Approximate arrival time.
  - Where the product is coming from.
  - The transportation company and equipment hauling the product.
  - A discharge plan including quantity to which tanks and product specifications.
  - A purchase order number.
  - Inspection information.
- Get a temperature and gauge tanks to be received into from the top using the outage prescribed for each tank.
- Figure the capacity of each tank to be received into using the normal maximum fill level making sure that there is adequate room for the quantity you have been instructed receive. Contact terminal superintendent if there are any discrepancies.
- Line up from the receiving tank to the dock line leaving one valve closed.
- Dock and barge or vessel PIC will complete connections, pre transfer conference and DOI as outlined when loading a barge or vessel.
- After establishing communication between all personnel that everything is ready to start pumping, lead operator will open the last terminal valve and dock PIC the dock valve. Barge or vessel PIC will start pump and give notification to all of the start.
- Monitor pressures and connections closely.
- Obtain a line sample during discharge and verify viscosity and API of product. Contact terminal superintendent if there are any major discrepancies.
- Upon completion vessel PIC will notify dock PIC that he is shutting down. This notification should be relayed via radio to the terminal lead operator monitoring the shore tank receipt.

- Close all valves. Displace lines as necessary after end gauging is completed. If tanks 4 or 5 were used in the receipt the lines will need to be displaced with air.
- Verify final quantities with barge or vessel and inspectors if used. Enter final gauges and temperature on bill of lading log and in computer system.
- Remove the boom.

1.0 Scope

Establish procedures for safe and efficient boiler operations.

1.2 Boiler Cold Start

Starting a boiler cold means it has been shut down for at least 4 days. Never bring a boiler on line fast, this can cause damage to the equipment. Damage is primarily from metal expansion, not to exclude normal expansion from the water to steam ratio in the boiler. Anything done fast without going through accepted procedures can cause problems or damage. Thoroughly check line-ups, water to the boiler, steam valves open or closed, gas valves and power to the boiler.

- Look to ensure that the water level in the boiler is at least two inches or more in the sight glass. This level will normally be over the float level in the sight glass float chamber. If it is not, the controls will not allow the boiler to be fired. It is okay to be a little high in the sight glass to begin with. Once the boiler firebox starts getting hot, the water will expand and the boiler will need to be drained using the blow down device.
- Boiler water feed system – check that the line is open all the way into the boiler. Part of this system is the chemical injection that should be open and ready to pump on demand. The system in Portland automatically pumps chemicals every time the feed water pumps come on. Not all systems are set up this way, some start pumping right off, they may feed into the D.A. tank and some may go in with the boiler feed water, direct to the boiler as this one does.
- After everything has been inspected the boiler is ready to be fired. Check that the main steam valve and gas valves are open. If the boiler is fired up against the main valve you will have pressure but keep in mind that there will not be a large volume of steam until the box gets hot and well on line.
- When ready to light off the boiler, check that the power is on and the gas valve is open. The fire control should be on manual, there is a scale running from low to high. Set it on the low firing position. Never start a boiler up on the automatic controller. Now you can switch the on/off toggle switch on the control panel to the on position. The boiler will come on and go through purge cycles with air, this is part of the safety system so that once the gas

does comes on and the igniter lights off it won't blow the boiler up. The boiler will light off with a small fire controlled by the manual firing control.

- Let the firing control warm the box for approximately an hour. Using the manual firing control turn up the fire control to about one third of the scale between low and high. Let it fire that way until you see a little pressure coming on. Turn the switch to 50 percent of scale and let the boiler come up to pressure slowly. Watch for leaks and water expansion. The boiler will need to be blown down if the water stays too full or out of the glass. When it gets to 100 pounds open the main valve into the steam headers, these valves are the lines that go into each tank farm outside of the boiler room. It is normal to open some steam into the new tank farm for tracing. Preplanning of which tanks need heat should allow for opening these headers when needed. When the pressure gets up to 120 pounds open the header into the system planned for heat. Open the steam valve into the tank farm or area to be heated. The boiler is not making much steam at this point other than pressure. Put the boiler on automatic. This will now control the boiler firing, will maintain the pressure at the maximum and fire back if demand is not called for. This boiler cannot meet the demand of too much pressure and heat going out, it will pull down even though the firing control is opening the gas valve to the maximum. Steam will need to be going into the other tank farms for tracing so adjust the boiler to keep and maintain them as well. The steam off of the boiler has a good condensate return so be sure to have these valves open.
- Procedures are written up without showing or explaining all of the fuel oil piping systems that are normally set up with tracings. Due to this the lines are all set up with pressure relief's around the valves into each tank so that heat and pressure expansion has a place to go. There could be an instance where all valves, including pressure relief valves, were closed. The procedure would then be to open all the valves so that the relief system could work before putting heat on it. This system is not normally closed unless planned for.
- A good practice when the boiler starts getting heat up is to go ahead and start the chemicals, put them on manual so that they will run full time, not just when the boiler demands water.
- Once the boiler is on line and making steam make sure that all of the systems are working properly. Blow down the sight glass chamber to test

the alarm. Blow down the low water. These safety systems will shut the boiler down besides giving off an alarm.

- If the boiler has been shut down for no more than 2 days it can be fired off and brought on line in about half the time because it is still warm. The water in the boiler is still warm to hot. The same steps should be followed. Check that the water feed pumps are open and lined up, main gas on, power switch on and steam header valves open or closed. Fire the boiler using the firing controls as previously stated. Use the manual firing control opened up one third of the scale. Let the boiler come up at it's own speed. You can bump it a little once there is heat on it. Go on line at 100 pounds or better and put the controls on automatic.

1.2 Boiler Shut Down

- Turn the toggle switch on the boiler firing control panel to the off position. Switch the automatic/manual firing control into the manual position.
- Close the main gas valve, shut off the breaker switch to the firing control. The boiler is still on line and will continue to make some steam for a while. Leave it on line to come down and cool on its own. Do not block it in, keep the boiler water feed on line to continue make up as long as needed. The boiler should not be blocked in until it has cooled to the point of not making any steam. It is better to let it get real cold than blocking it on it and raising the safety's because the boiler is still hot and making steam. Normal practice is to isolate a boiler when taking it out of service, block in steam valves, water feed pumps and valves and chemicals.
- With the system at the Portland terminal you leave some things lined up, the boiler water feed with just the power off, the main steam open off the boiler with headers closed only outside of the boiler building. Some need to be shut as previously stated, the main gas valve and power shut off
- If a long shut down is planned you will need to shut the whole system off, including water to the D.A. tank. Make a checklist for the person doing a restart.

1.3 Winterizing the Boiler and Lines

- Winterizing the boiler and lines must be done every year when it starts to get cooler and there is a potential for freezing temperature.
- Inspect and repair any damage to the pipeline insulation.
- If the temperature is forecasted to be below freezing, drain lines that are susceptible to freezing at low temperatures and not going to be in use. Include the waterlines from the office that go out to the dock, steam lines, steam tracing and the airlines because they do accumulate a little water. Note that the fire lines are dry loops and do not require draining.
- The normal procedure for freezing temperatures is to keep the boiler on line with steam on all tracing lines and possibly some steam going to Tank 1,3 or 7 which have tank coils inside. Steam does not need to be circulated through Tank 4 or 5 because they utilize a heat exchanger rather than tank coils.
- New procedure – bleed off valves will be installed on the live steam pressure points in both tank farms so that they may be either vented or drained to prevent freezing in either a case of th4e boiler being down or no steam being used and it being a dead cold leg.
- Winter/Cold weather drain out points.
    - The pressure manifold outside of the boiler room. A bleeder valve will be on the crossover trap line to the condensate return to the boiler. This will need to be opened and drained down if the boiler is down. If this is done open the line to the new tank farm so that the line can drain all the way back including the overhead lines.
    - Water drain vent point bleeder will be on the steam exhaust off the exchanger at Tank 4. A lot of the time this line to Tank 4 will be a dead leg so it may be used to keep a little flow that way or total drain. The valve supply at the boiler house will be closed.
    - Drain out vent points are in the new tank farm, the steam supply tees off, one line going to Tank 1 and the other to Tank 3, to supply the steam coils. Each line traps off into the same line that is the exhaust for the coils. At this point there is an isolation

valve before the trap at each tank. There is a bleeder valve just past this valve on each on of the lines to Tanks 1 or 3 for draining the system. Open it and drain all the water from the supply lines if the boiler is down. If the boiler is on line then it will trap water through the system and feed water back via the condensate pumps to the boiler.

- The live steam feed to the dock. This line comes off of the steam supply to the new tank farm. There is a valve and open connection on the dock that can be opened and drained down when the boiler is down or used as a vent point. Most of the time this would be used to trap water back into the return system.
- The steam line to Tank 5 at the exchanger has a trap line over to the condensate return with a bleeder valve on it. Use this if the boiler is down and there is freezing weather. Note that Tank 5 is in VGO service so the line to this bundle will be a dead leg other than heat for the Roper pump tracing. Use this as a bleeder/vent or leave a little steam venting around the pump tracing.
- The steam supply to the railspur is always closed off by the separator vessel south of Tank 5. It has a bleed off valve at this point, open and drain it or use as a vent in a cold snap.

- There is a warm water condensate return system in both tank farms. These lines are insulated, all of the tracing , coils or exchangers trap into these tanks and work off of a level control that pumps the water back into the boiler water feed tanks. If the boiler is operational, this system stays warm.
- If the boiler is down, drain the collection tank. Condensate water at Tanks 4 and 5 have pump drain valves.
- The new tank farm has a drain valve on the pump out lines to bleed off the water. This is a low spot so most of the line will drain.
- The steam supply to the steam tracing manifolds has a bleed off in front of the small manifolds at the Tank 3 area and in the area of the truck unloading racks and steam supply to Tank 7. You will need to familiarize yourself with these vent out points.
- There is a steam trap on the transfer line from Tank 4 to the meter. This trap is down at the bottom of the wall inside the old tank farm. There is a bleeder valve on it so it would be another drain point if the boiler is down and situation calls for going through this procedure.

- The condensate tanks and pumps have drain valves at tanks 4 and 5.

I. Terminal-to-Barge Operations

A. Loading Procedures

1. Take opening gauges and temperatures on all tanks involved in the operation. Make sure that tank mixing has been stopped for at least 30 minutes prior to gauging.
2. Compare gauges to the daily adjust-to-physical or to the previous operation to ensure quantities agree.
   a. If an opening gauge disagrees with the previous gauge by more than ¼% of the total volume or 50 net bbls (whichever is less), regauge the tank and locate the error.

   Note for tanks 1, 2, 4 and 5: 1/8 in = approx. 20 net bbls, therefore gauges are acceptable if they are off by more than ¼% of the tank volume but less than 20 net bbls.

   b. If you cannot account for the discrepancy within the defined range, contact the terminal superintendent before proceeding.
3. Verify that the valves are lined-up properly. Where piping is connected from the same manifold to different tanks, care must be taken to ensure that all valves not in use are closed.
4. Upon arrival of the barge, boom in the barge. Verify that the barge has the correct number of mooring lines connected to the dock.

Barge Capacity	Number of Lines Required
< 50,000 bbls	6
>50,000 bbls, but <100,000 bbls	8
> 100,000 bbls	12

5. Fill out DOI with tankerman and confirm product types and quantities. Also confirm any barge retain.
6. Hook up hoses to the barge. Open valve when barge tankerman confirms that he is ready to begin.
7. Notify shift supervisor to start pumping when ready.
8. Shift supervisor shall start the first pump and notify dockman that pumping has begun.

9. Shift supervisor shall start up additional pumps one at a time after confirmation from tankerman that product is being received on the barge.
10. Loading procedures
    a. If inline blending, adjust flow rates of the different tanks via the meter to match the desired loading percentages (this should be completed within the first half hour).
    b. If barge blending, load the tanks one at a time in order of increasing API gravity, unless otherwise instructed. Make sure that the tankerman spreads each product out evenly across the barge.
11. Check loading progress and confirm tank percentages (if inline blending) every 30 minutes, or more often if necessary.
12. Near end of load, make sure that the tanks with smaller percentages have been loaded, and finish off the load with the largest percentage product.
13. Shut off pumps.
14. Take closing gauges on all tanks involved.
15. Compare shore volume to barge volume.
    a. If volumes differ by less than 20 net bbls, the barge may be released.
    b. If volumes differ by more than ¼% or 50 net bbls (whichever is lower), attempt to rectify the difference by regauging the shore and/or barge tanks.

Loaded quantity (in bbls)	¼% (in bbls)
8,000	20
10,000	25
15,000	37.5
20,000	50
25,000	62.5
30,000	75
40,000	100

    c. If the difference is still greater than ¼% or 50 net bbls (whichever is lower), contact the terminal superintendent before releasing the barge.

16. If quantity loaded/pumped is not within ±1% of the quantity written on the PO, record this in the logbook and send e-mail to terminal superintendent. If loaded quantity varies by more than ±2%, contact the terminal superintendent immediately.

B. Sampling

1. A sample of each grade product shall be drawn during the transfer of shore discharge to barge.
2. A clean dry gallon sample bottle should be attached to the line and the flow adjusted to remain consistent throughout the load. Continue to step 5.
3. If a line sample cannot be obtained, upon completion of load samples shall be collected in accordance with ASTM D-270, all level composite sample method. All sample containers should be clean and dry prior to sampling.
    a. Cork a sample thief and lower it to the bottom of the barge compartment.
    b. Release the cork by a firm pull on the thief rope.
    c. Raise the sample thief at such a rate that the bottle is not full when the surface of the oil is broken.
4. Combine samples from each compartment in a 1-gallon container. Enough samples must be taken such that there is enough total sample to fill three (3) 1-quart containers.
5. Test the viscosity and gravity of the barge composite as described in Section III. Record results on the "crew results" page in the computer program.
    a. If product is off spec, the barge is to be mixed (if barge has mixing capability) and new samples drawn and tested.
    b. For IFO 180, 280, or 380:
        i. API Gravity must be greater than or equal to 11.2. Blends are targeted for 11.5.
        ii. Viscosity should be within 4% of the target viscosity. However, it cannot exceed the IFO maximum of 180, 280 or 380 cSt.

c. If product is still off spec, call terminal superintendent for further instruction.

6. Divide barge composite into 3 sample containers and label each can with the following:
   a. Date
   b. Barge number
   c. Ship name
   d. Person's name sampling
   e. Type of Sample
7. Retain two samples and give third sample to the barge tankerman. Keep barge composite samples onsite for 90 days.
8. Complete paperwork and release the barge.

II. Barge-to-Terminal Operations

A. Unloading Procedure

1. Take opening gauges and temperatures on all tanks involved in the operation. Make sure that tank mixing has been stopped for at least 30 minutes prior to gauging.
2. Compare gauges to the daily adjust-to-physical or to the previous operation to ensure quantities agree.
   a. If an opening gauge disagrees with the previous gauge by more than ¼% of the total volume or 50 net bbls (whichever is less), regauge the tank and locate the error.

   Note for tanks 1, 2, 4 and 5: 1/8 in = approx. 20 net bbls, therefore gauges are acceptable if they are off by more than ¼% of the tank volume but less than 20 net bbls.

   b. If you cannot account for the discrepancy within the defined range, contact the terminal superintendent before proceeding.
3. Upon arrival of the barge, boom in the barge. Verify that the barge has the correct number of mooring lines connected to the dock.

Barge Capacity	Number of Lines Required
< 50,000 bbls	6
>50,000 bbls, but <100,000 bbls	8

> 100,000 bbls	12

4. Fill out DOI with tankerman and confirm product types and quantities.
5. Take 1-gallon line sample during transfer from barge to shore. Continue to step 6.f.
6. If a line sample cannot be obtained, take 1-gallon composite sample from the barge.
    a. Samples shall be collected in accordance with ASTM D-270, all level composite sample method. All sample containers should be clean and dry prior to sampling.
    b. Cork a sample thief and lower it to the bottom of the barge compartment.
    c. Release the cork by a firm pull on the thief rope.
    d. Raise the sample thief at such a rate that the bottle is not full when the surface of the oil is broken.
    e. Combine samples from each compartment in a 1-gallon container.
    f. Label container with the following information:
        i. Date
        ii. Barge number
        iii. Source
        iv. Person's name sampling
        v. Type of Sample
    g. Store onsite for 90 days.
7. Verify that the valves are lined-up properly. Where piping is connected from the same manifold to different tanks, care must be taken to ensure that all valves not in use are closed.
8. Open valve on the dock line to the first receiving tank and inform dockman when ready to begin.
9. Verify that product is being received into the correct tank.
10. Gauge tank after one hour (assuming the tank takes longer to fill than one hour) to determine flow rate and estimate time needed to fill tank.
11. Continue to gauge tank hourly and adjust estimations on fill time.
12. If a tank is being filled to the safe fill level:

a. The shift supervisor must monitor the product level frequently for the last 20 minutes of the transfer to ensure that the tank does not overfill.
b. Shift supervisor shall notify dockman and tankerman when the tank is almost full so that the tankerman can be ready to shutoff pumps in the event of an emergency or accident.
c. Based upon receiving rate, the shift supervisor shall allow enough time to open the inlet valve to the next receiving tank before the safe fill level is reached. Shift supervisor shall notify dockman and tankerman when preparing to change receiving tanks.
d. After opening the valve to the next receiving tank, shift supervisor shall close the valve on the full tank. Shift supervisor shall notify dockman and tankerman that the valve change has been completed.
e. Repeat process until all product is received.

13. Take closing gauges on all tanks involved.
14. Enter closing gauges into HAL and estimate a closing gravity based upon projected specs of incoming product.
15. Compare shore volume to barge volume.
    c. If volumes differ by less than 20 net bbls, the barge may be released.
    d. If volumes differ by more than ¼% or 50 net bbls (whichever is lower), attempt to rectify the difference by regauging the shore and/or barge tanks.

Loaded quantity (in bbls)	¼% (in bbls)
8,000	20
10,000	25
15,000	37.5
20,000	50
25,000	62.5
30,000	75
40,000	100

a. If the difference is still greater than ¼% or 50 net bbls (whichever is lower), contact the terminal superintendent before releasing the barge.

16. Mix tanks with air and sample as instructed in Section IV B.

17. Test samples for viscosity and gravity as described in Section III.

18. Keep one composite sample per tank for independent lab testing.

19. Update the tank specs in the computer program and also update the closing gravities on the bill of lading associated with this receipt.

III. Testing Procedures

A. API Gravity

1. Equipment needed
   a. API Gravity bath
   b. Graduated hydrometer with incorporated thermometer
      i. Diesel-MDO = 29-41 scale
      ii. Black Oil = 9-21 scale

2. Procedure
   a. Pour sample into API Gravity bath cylinder.
   b. Insert hydrometer into the liquid.
   c. Let sample heat slowly and stir often.
   d. Allow enough time for the hydrometer to settle and come to rest. Make sure the hydrometer is floating freely away from the cylinder walls.
   e. Read the scale to the nearest 1/10 degree API. (The point read is that point on the hydrometer scale at which the surface [a distorted ellipse] appears to become a straight line cutting the hydrometer scale).
   f. After the hydrometer scale value is taken, record the temperature of the sample to the nearest 0.5° F. Make sure that the temperature is stable when recorded, not falling or rising.

g. Use the API conversion tables (corrected to 60 F) and enter the API value and temperature the API value was taken at. Read the API corrected to 60F and record.

B. Viscosity

1. Equipment Used – 2 main types
   a. Saybolt-Furol Viscosimeter
   b. Kinematic Viscosimeter
   c. Timer or stopwatch
   d. Thermometer
2. Procedure for Kinematic Viscosimeter
   a. Inject oil sample into capillary tube and fill to the marks etched on the top chamber.
   b. After acclimating for 20 minutes in a 122° F oil bath, to start the oil through, take the rubber bulb and force air into the capillary, thereby forcing the oil to the measuring or timing mark on the lower end of the capillary tube. Holding your finger over the top of the tube works too. Do not keep air on it long enough for oil to move down the capillary.
   c. When the <u>first</u> timing mark is reached, depress the timer (stopwatch) and take a final reading in seconds when the oil level reaches the <u>second</u> timing mark.
   d. Round seconds to the next higher value when fraction of a second is greater than or equal to 0.5. Multiply this value in seconds by the corrective factor for the tube and record this value as centistokes (cst.)

C. Bitumens, Sediment and Water (BS&W)

1. Take 100 mL BS&W tube and fill to the 50 mL mark with hot toluene.
2. Fill tube to 100 mL mark with oil to be tested. (*Warm the oil to at least 122 F to facilitate mixing of the oil with the toluene.)
3. Shake tube vigorously until the contents are thoroughly mixed (check by tilting tube bottom upwards and see that bubbles form rather than a deposit of oil).

4. Stopper the tube and place in the centrifuge. Centrifuge for 3-10 minutes.
5. Remove tube, tilt upside down and look for water/sediment deposit in the tube.
6. Read to the nearest 0.1. BS&W values of >1.0% are cause for concern.

* The reason toluene is added is to dilute or thin the sample to make the flow of BS&W to the bottom of the tube easier and to dissolve any soluble gums and resins that could create a false reading.

IV. Blending Operations

A. Transfers

1. Take opening gauges and temperatures on all tanks involved in the operation. Make sure that tank mixing has been stopped for at least 30 minutes prior to gauging.
2. Compare gauges to the daily adjust-to-physical or to the previous operation to ensure quantities agree.
   a. If an opening gauge disagrees with the previous gauge by more than ¼% of the total volume or 50 net bbls (whichever is less), regauge the tank and locate the error.

   Note for tanks 1, 2, 4 and 5: 1/8 in = approx. 20 net bbls, therefore gauges are acceptable if they are off by more than ¼% of the tank volume but less than 20 net bbls.

   b. If you cannot account for the discrepancy within the defined range, contact the terminal superintendent before proceeding.
3. Start mixing the receiving tank once it contains a few feet of product.
4. Transfer products to the receiving tank in order of increasing API gravity, starting with the lowest gravity product first. If gravities are comparable, transfer higher viscosity products first.
5. Take closing gauges and temperatures on all tanks involved. Make sure that tank mixing has been stopped for at least 30 minutes prior to gauging.
6. Compare total volume out to total volume in.

a. If the volumes vary by more than ¼%, regauge the tanks and attempt to rectify the difference.
b. If the gain or loss in bbls can still not be found, send e-mail to terminal superintendent and record in the logbook. Include volume difference and operator on duty.

7. Turn on air to the receiving tank to mix.

B. Sampling

2. In order to get a good representation of the tank, upper, middle and lower level samples shall be taken, except for the following instances:
   a. Tank 7 requires only one all-level sample.
   b. If product level is below 1/3 of the tank height, only one all-level sample is required.
3. Lower the weighted, stoppered bottle to the proper depths as follows:
   a. Upper level = middle of the upper 1/3 of the tank
   b. Middle level = middle of tank
   c. Lower level = level of the fixed tank outlet (approximately 1-2 feet off bottom)
4. Pull out stopper with a sharp jerk of the cord, and allow the bottle to fill completely at the selected level, as evidenced by the cessation of air bubbles.
5. Raise bottle and pour into the sample container.
6. Test each sample for API gravity and viscosity as described in Section III. If gravities vary by more than 0.2, continue mixing the tank.
7. Repeat process until gravities of all three samples are within 0.2.
8. Take an average of the three samples and update the viscosity and gravity of the tank in the computer program, HAL. Update the date in the flash column.
9. Update closing gravities on any bill of ladings associated with the operation.
10. Make a composite sample for independent lab testing.

V. Terminal-to-Truck Operations

1. Upon arrival of truck at terminal, confirm destination and product with the driver.
2. Verify that the truck driver is authorized to load at the facility and has received training.
    a. If driver has not received training, he must do so before loading.
3. A PTSI member must visually inspect truck tank to ensure that there is no retain on the truck. If there is retain, determine the quantity and product type. If the retain could throw the load off-spec, do not load product. Call the terminal superintendent for further instruction.
4. Issue meter ticket.
5. Ensure that valves are lined up properly
    a. Notify driver when he may begin.
    b. Truck driver is responsible for inserting meter ticket and loading the truck in a safe matter without spills or overflows.
    c. Samples must be collected by a PTSI employee.
        i. One sample must be taken on all government loads.
        ii. One sample must be taken per day of each product going out by truck (e.g. Sample first truck going out with 6 oil and the first truck going out with PS300.)
    d. Properly label samples and keep onsite for 30 days.
    e. Upon completion of load, driver will return the meter ticket to a PTSI employee for completion.
    f. Fill out bill of lading form. Give truck driver all paperwork except the white and blue copies of the bill of lading. Keep blue copy at terminal and send white copy to accountant.
    g. Record net gallons loaded in computer program, HAL.

VI. Truck-to-Terminal Operations

1. Take opening gauge on receiving tank.
2. Ensure valves are properly lined up and inform driver when he can begin to unload.
3. Take closing gauge on tank when finished receiving product.

4. If opening and closing tank gauges are not accurate enough to determine quantity delivered, the weight ticket provided by the truck driver may be used.

VII. Railcar-to-Terminal Operations

1. Upon arrival of railcars, check car numbers against list to determine supplier.
2. Open car domes and hook up steam to railcars as needed.
3. Take one sample from each type of railcar (e.g. Amoco Mandan, Texpar Regina).
   a. Samples shall be collected in accordance with ASTM D-270, all level composite sample method. All sample containers should be clean and dry prior to sampling.
   b. Cork a sample thief and lower it to the bottom of the railcar.
   c. Release the cork by a firm pull on the thief rope.
   d. Raise the sample thief at such a rate that the bottle is not full when the surface of the oil is broken.
   e. Label can with the following information:
      i. Date
      ii. Railcar number
      iii. Source
      iv. Person's name sampling
   f. Store onsite for 45 days.
4. Send e-mail to terminal superintendent with railcar numbers. Terminal superintendent will designate a receiving tank.
5. Determine order of unloading. If possible, save a car with a low viscosity for last to flush the line.
6. Take opening gauge on receiving tank.
   a. If an opening gauge disagrees with the previous gauge by more than ¼% of the total volume or 50 net bbls (whichever is less), regauge the tank and locate the error.

   Note for tanks 1, 2, 4 and 5: 1/8 in = approx. 20 net bbls, therefore gauges are acceptable if they are off by more than ¼% of the tank volume but less than 20 net bbls.

b. If you cannot account for the discrepancy within the defined range, contact the terminal superintendent before proceeding.

6. Unload cars to the designated tank.
7. Take closing gauge on receiving tank.
8. Determine average railcar volume from opening and closing gauges and enter each car into HAL, including railcar number.
9. Mix tank with air and sample as instructed in Section IV B.
10. Make a composite tank sample for independent lab testing if requested by the terminal superintendent.

NOTE: Receiving tank may be mixed with air before, during and after the unloading of the railcars, however tank mixing must be stopped for at least 30 minutes prior to taking opening or closing gauges.

1.0 SCOPE

This procedure establishes safe and accurate standards for conducting the loading and off-loading of trucks and/or trailers.

1.1 Procedure for Loading a Truck

- Tanks and lines used for truck loading are normally kept in the same product service so they are ready for loading without extra activity.
- Carriers are normally the same drivers who are familiar with this facility. If this is not the case, check with the terminal superintendent to verify the load and ensure that the driver is informed of terminal procedures and safety standards.
- Prepare a truck bill of lading (meter ticket) filling out all of the following information:
    - Date
    - Customer order number
    - Loading location
    - Consigee
    - Delivery address if available
    - Sulfur percentage
    - Product
    - Arrival and load times
    - API gravity
    - API temperature conversion factor
    - Loading temperature
    - Loading tank
    - The company name
    - Your signature
- Have the driver spot the truck and line up the spouts.
- Start the pump and open the last valve under the truck rack.
- Upon completion of loading, shut the pump down and block the valve under the truck rack.

- The driver should complete the bill of lading with the following information.
  - Gallons loaded
  - Truck and trailer number
  - Company name
  - Driver signature
- Retain 2 accounting copies of the completed bill of lading.
- All loads should be logged on the bill of lading report and entered into the computer system.

1.2 Procedure for Receiving from a Truck

- Carriers are normally the same drivers who are familiar with the facility. If this is not the case, check with terminal superintendent to verify the load and ensure that the driver is informed of terminal procedures and safety standards.
- You will be informed of the following information prior to the arrival of a truck receipt.
  - Approximate arrival time.
  - Where the product is coming from.
  - The transportation company hauling the product.
  - How much product or number of loads expected.
  - What type of product.
  - A purchase order number.
  - Which tank product should be received into.
- Verify all paperwork. Check straight Bills of lading or meter tickets for amounts. If product is not metered the truck must have both a light and heavy weight ticket.
- Sample truck
- Test samples to verify the product to be received.
- Take opening gauge on receiving tank.
- Line up receiving tank using terminal or truck pump.

- Hook up the loading hose.
- Connect ground connection
- Unload
- All loads should be entered on the bill of lading report and entered into the computer system.

1.0 SCOPE

To provide accurate and reliable information for the safe handling of hazardous materials.

1.1 GENERAL

- The terminal manager is the person responsible for this Hazard Communications Program.
- The inventory of hazardous substances is in the MSDS manual.
- Material Safety Data Sheets (MSDS's) for all hazardous substances are located in the MSDS manual located in the control room in the boiler building.
- A copy of the OSHA Hazard Communication Regulation is attached to this Hazard Communications Program.

1.2 PROCEDURES

- Employees may review MSDS's and the regulations by requesting the Hazard Communications Program and/or the MSDS manual from the on-duty Lead Operator. Copies shall be provided to the employee freely on request.
- The MSDS's will be updated as new information is received or new hazards are identified. Any new hazard information shall be reported immediately to the Terminal Manager and affected employees will be notified within 30 days.
- Containers of hazardous materials entering the plant will be checked by the on duty Lead Operator to assure that they are properly labeled with the chemical name of the contents, the appropriate hazard warning and the name and address of the supplier or manufacturer. If MSDS's are not available for new hazardous substances received, the on duty Lead Operator will notify the Terminal Manager immediately who shall obtain one from the supplier or manufacturer.
- In plant containers of hazardous materials will be labeled with the chemical name and hazard warning. Exceptions must be approved by

the Terminal Manager. The following exceptions have been approved.

- The contents of the Fuel Oil Tanks will be identified by a list contained in the Operations Manual.
- Pipelines containing hazardous substances are not considered containers by the regulations and are not labeled.

- Non- routine tasks involving hazardous materials are listed below. Procedures for safely performing these and other non-routine tasks include safe entry procedures for tank cleaning and other instructions from the Terminal Manager.
  - Tank Cleaning.
  - Hydrostatic Pipeline Testing.
  - Pump and Equipment Maintenance.
  - Treating of Fuel Oil.
  - Emergency Spill Response.
- Employee training involving safe handling of hazardous substances is provided initially to all employees and for all new employees. This training covers the following areas.
  - The basic requirements of the Hazard Communications Regulations and employee rights to information.
  - This Hazard Communications Program and procedures to follow to see the regulations, the program or MSDS's.
  - How to interpret labels on containers of hazardous chemicals.
  - How to use MSDS's to get information about physical hazards and health effects of hazardous substances.
  - How to handle hazardous substances safely.
  - How to detect leaks and spills.
  - What to do in the case of an emergency spill of over exposure.
- Training is documented by attendance in Haz-Wopr annual training with a certificate to the employee's training file.
- Training concerning significant new hazards, either for new hazardous chemicals or from revised MSDS's will be provided with 30 days and documented.
- Outside employees (visitors and contractors) have a right to know about the hazardous substances that they may encounter at the facility. They will be advised of chemical hazards in the facility by the on duty Lead Operator in a pre-job meeting. Contractors will be required to

provide information on any chemicals used in the facility in their work.

- Pacific Terminal Services relies on the information contained in MSDS's as permitted by OSHA Hazard Communications Regulations and does not perform independent hazard determinations.

1.0 SCOPE

This standard operating procedure is to ensure all changes to a process are properly reviewed and hazards introduced by the change are identified, analyzed, and controlled prior to retuming to operation. The objective is to reduce the likelihood of an incident. Following the procedure will result in the following:

- Changes will be planned and approved prior to implementation
- Incidents will be anticipated and prevented.
- The change will be designed so as to reduce the likelihood of an incident occurring or will limit its consequences.
- The change will be communicated to all persomel.

1.1 References

This standard references, ***but is not limited to***:

- SOP 2 – Hazard Communication Standard
- Contractor EHS Standards Booklet

1.2 Definitions

Change: A change includes any variation from previously approved practices, equipment, products, or personnel.

2.0 RESPONSIBILITIES

- It is the responsibility of the Facility Manager to ensure that the facility complies with the minimum standards defined by this Standard and all applicable national, state and/or local regulations.

- At a minimum each facility shall:

  - Ensure that all applicable laws and regulations are understood and being followed;
  - Ensure that management of change process is in place and up to date;

- Ensure that employees managing change are being properly trained; and
- Take effective corrective and preventative action where deficiencies are observed.

3.0 TYPES OF MANAGEMENT OF CHANGE

A change happens whenever one or more of the following events described in this section occurs.

Business Plans and Policies: A MOC form is needed when changes are made to business plans and corporate policies. These are documents that communicate strategic, operations, budgetary, or organizational directives that drive business operations. Organizational changes that impact the structure and relationships within and between business units or work groups also fall within this category of change.

Equipment: A MOC form is needed when changes are made affecting equipment such as:

- Operating equipment other than "in kind" (pump, piping, calve, instrument, vent , bleeder, etc.) is added or replaced, tied-in, removed or altered in any way that could affect or change the process or the capacity of the system.
- Changes are made in the pipe classification, major pump components (including seals), alarms and control schemes and configuration of piping.
- Operating parameters are changes to that they are outside the established design specifications (maximum or minimum) for thee allowable pressure, flow rate, level, te4mperature, etc.
- A temporary fix is made to a process system or piping, unless a written procedure exists for it.

Personnel: A MOC form is needed when changes are made in employees or contractors as well as changes to the work schedules.

Plant Operations: A MOC form is needed when changes are made to plant processes and operations to include: product safety information, blends,

pressure changes, flow direction changes, storing new products, reactivating idle equipment, deactivating equipment, software/program changes.

Procedures: A MOC form is needed when changes are made to documentation of woark methods performed by individuals such as: operating procedures, maintenance procedures, safe work practices, and emergency response plans.

Standards: A MOC form is needed when changes are made to standards or qualitative criterial for products and processes such as: test methods, product integrity standards, equipment specifications, construction specifications, engineering standards, and measurement standards.

Supply Sources: A MOC form is needed when changes are made to supply sources and customers.

4.0 MANAGEMENT OF CHANGE PROCEDURE

The originator identifies the need for a change and contract the Facility Manager to start the MOC process. The originator completes a MOC form as follows:

- Introduction: The introduction section contains information used to identify the change, its type, the originator, the location and the reason for the change.
- Originator: This is the person who has identified the need for the change.
- Affected locations: This is the location or operation affected by the change.
- MOC Number: The originator obtains a MOC number from the Facility Manager. The format for the number is: sequential number, the facility name, and the last two digits of the year. For example, 001-Portland-03.
- Type of change: Select the type of change: business plans or pohcies, equipment, personnel, plant operations, procedures, standards, or supply sources.
- Date submitted: This is the date the MOC was prepared and submitted for review and approval.
- Reason for change: Enter the reason for the change: safety/risk reduction, cost savings, regulatory requirement, legal requirement,

customer requirement, business plan, process improvement, operational excellence, capital stewardship, or profitable growth.

- Describe the change: The intent of the description is to provide any additional information necessary to understand the change beyond simply listing the type and reason.
- Tasks selection: This section is sued to list the specific actions required to implement the change.
- Responsible party: The secfion contains the names of the personnel that have been assigned to each task.
- Due date: This is the scheduled completion date for each task.
- Completed: This is the actual completion date for each task.
- Risks section: This section is used to list the specific risks associated with the change.
- Communication section: This section identifies the groups impacted by this change and the plan how you will communicate the change to those groups.
- Approvals section: The facility manager will identify the required reviews and approvals to ensure the change is properly prepared, managed, and safely implemented.